C/CAG
City/County Association of Governments of San Mateo County

Caltrans

San Mateo Countywide Sustainable Streets Master Plan

Reid Bogert
Stormwater Program Specialist
Countywide Stormwater Program

flowstobay.org
SAN MATEO COUNTYWIDE
WATER POLLUTION PREVENTION PROGRAM
Clean Water. Healthy Community.

Sustainable Streets

Complete Streets + Green Infrastructure

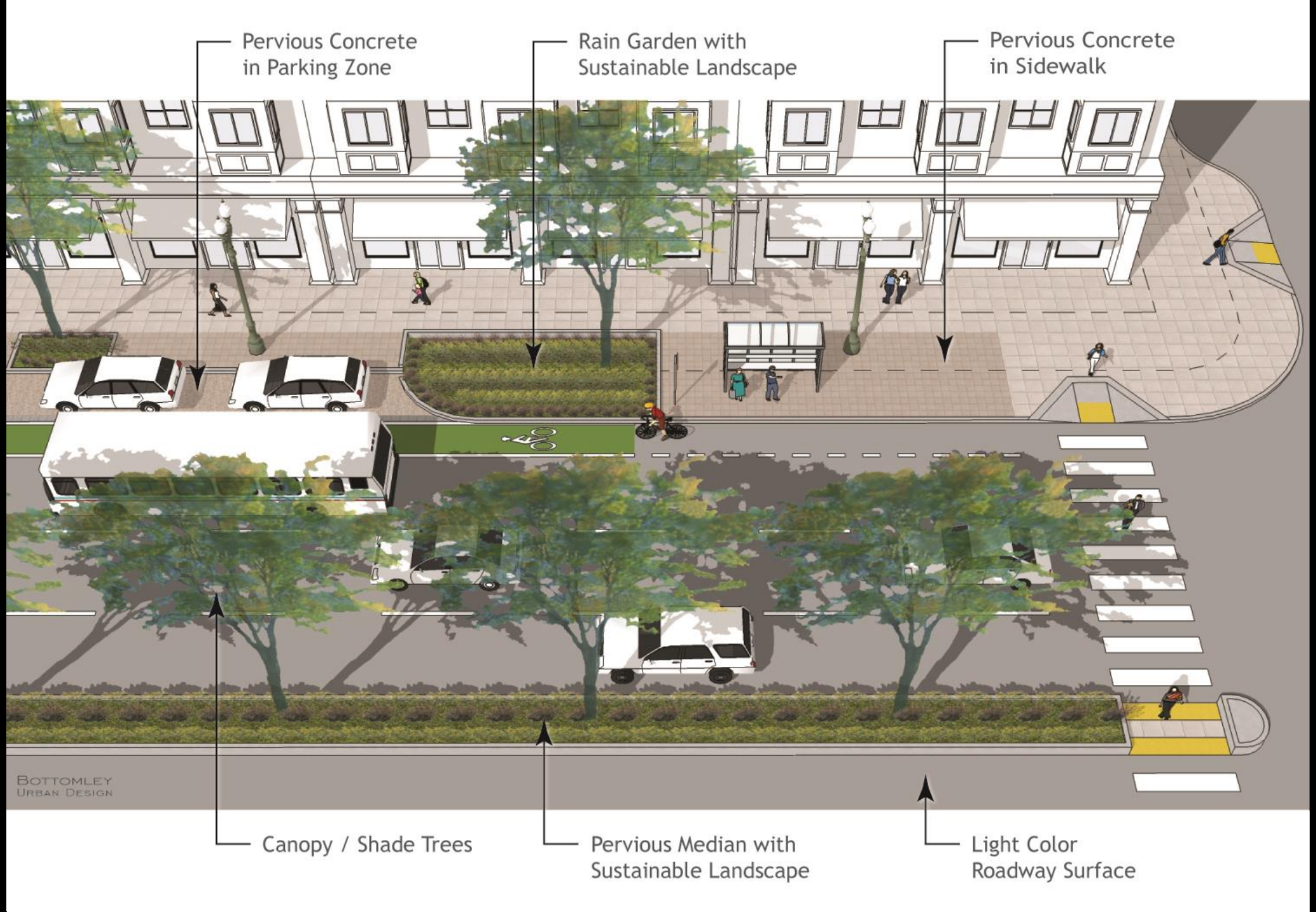
Sustainable Streets provide safe mobility and access for all users with the added environmental and community benefits of green infrastructure

What are sustainable streets?

SUSTAINABLE STREETS provide **safe mobility** and **access for all users** with the added environmental benefits of green infrastructure to **collect and clean stormwater runoff** in place, minimize the burden on the storm and sewer systems, and **protect our creeks, the Bay, and Ocean**.

COMPLETE STREETS

GREEN STREETS


Pervious Concrete
in Parking Zone
Rain Garden with
Sustainable Landscape
Pervious Concrete
in Sidewalk
Canopy / Shade Trees
Pervious Median with
Sustainable Landscape
Light Color
Roadway Surface
BOTTOMLEY
URBAN DESIGN

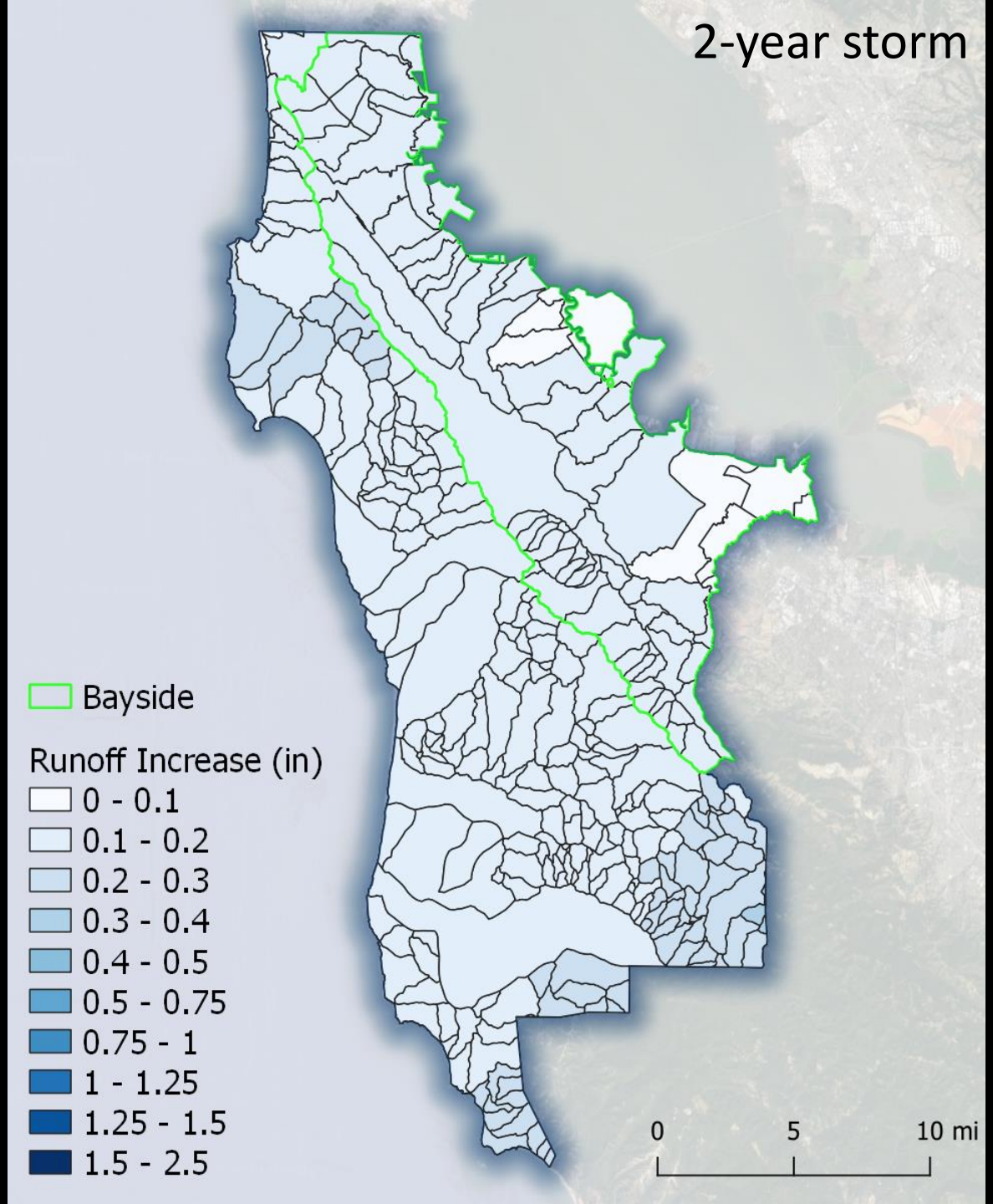
Project Drivers

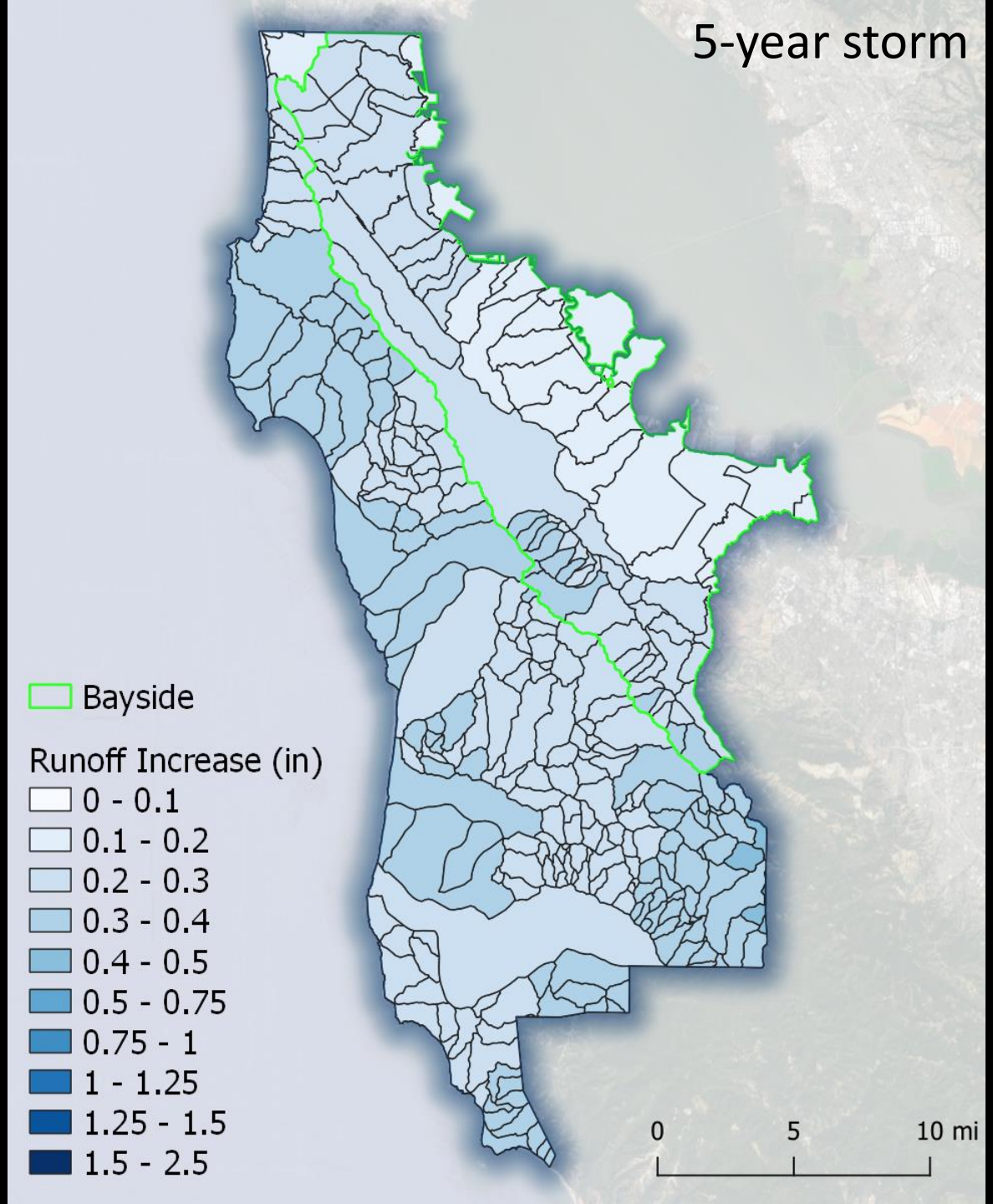
Key Drivers

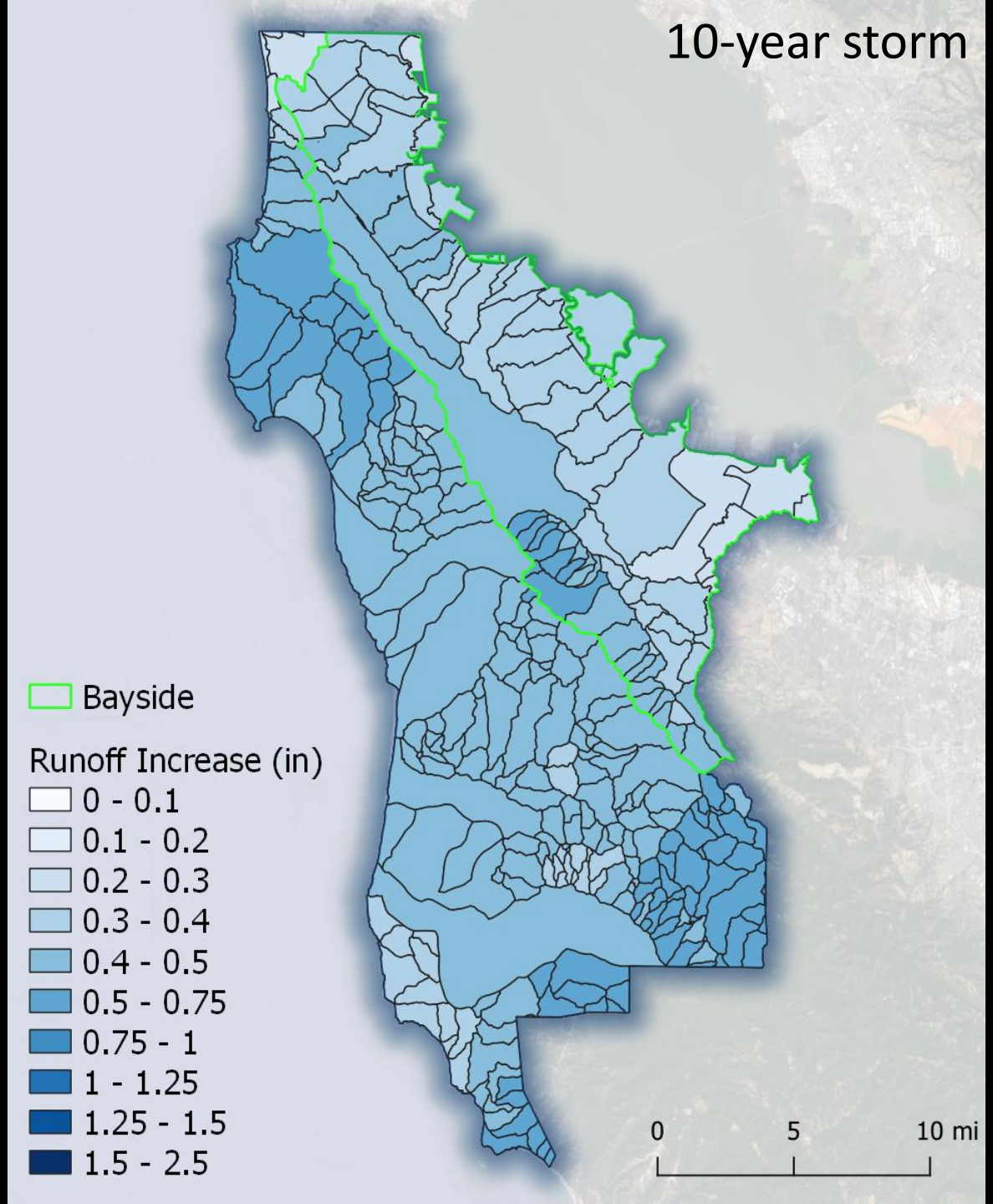
- Water quality mandates
- Climate change and resiliency

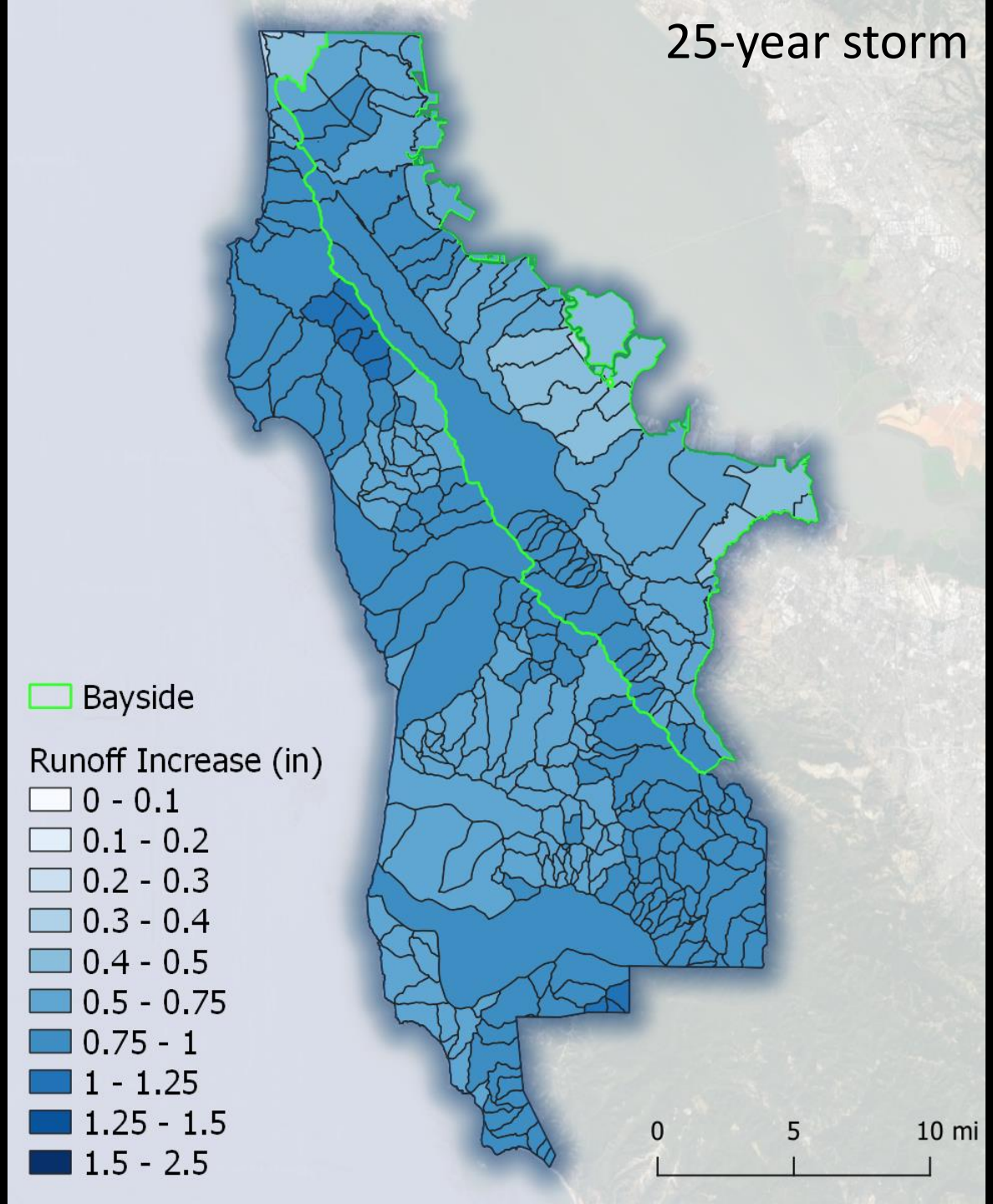
Needs

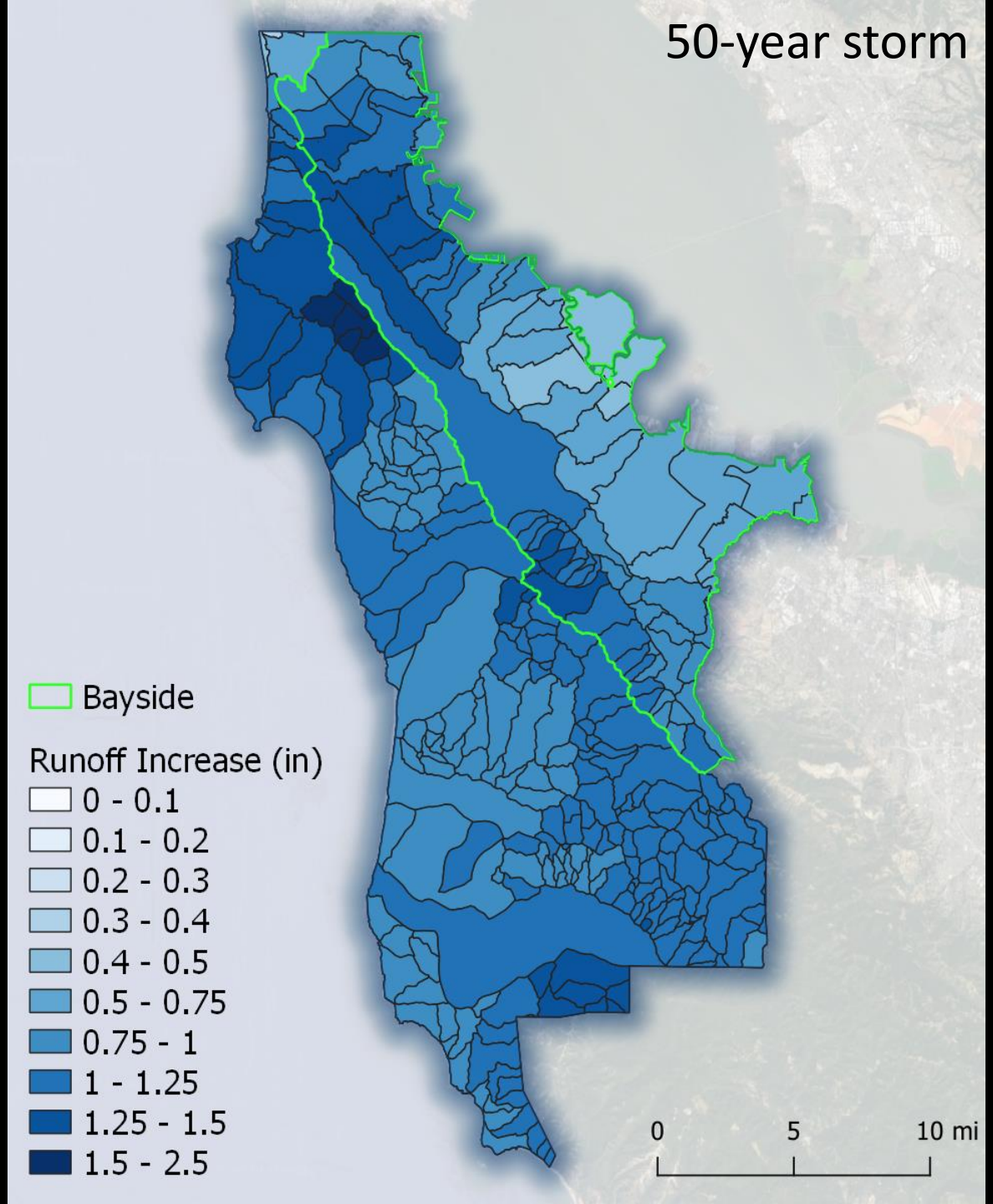
- Prioritized project opportunities
- Understanding how climate change will impact stormwater
- Integrated, multi-benefit investments
- Tools to advance planning, design and implementation

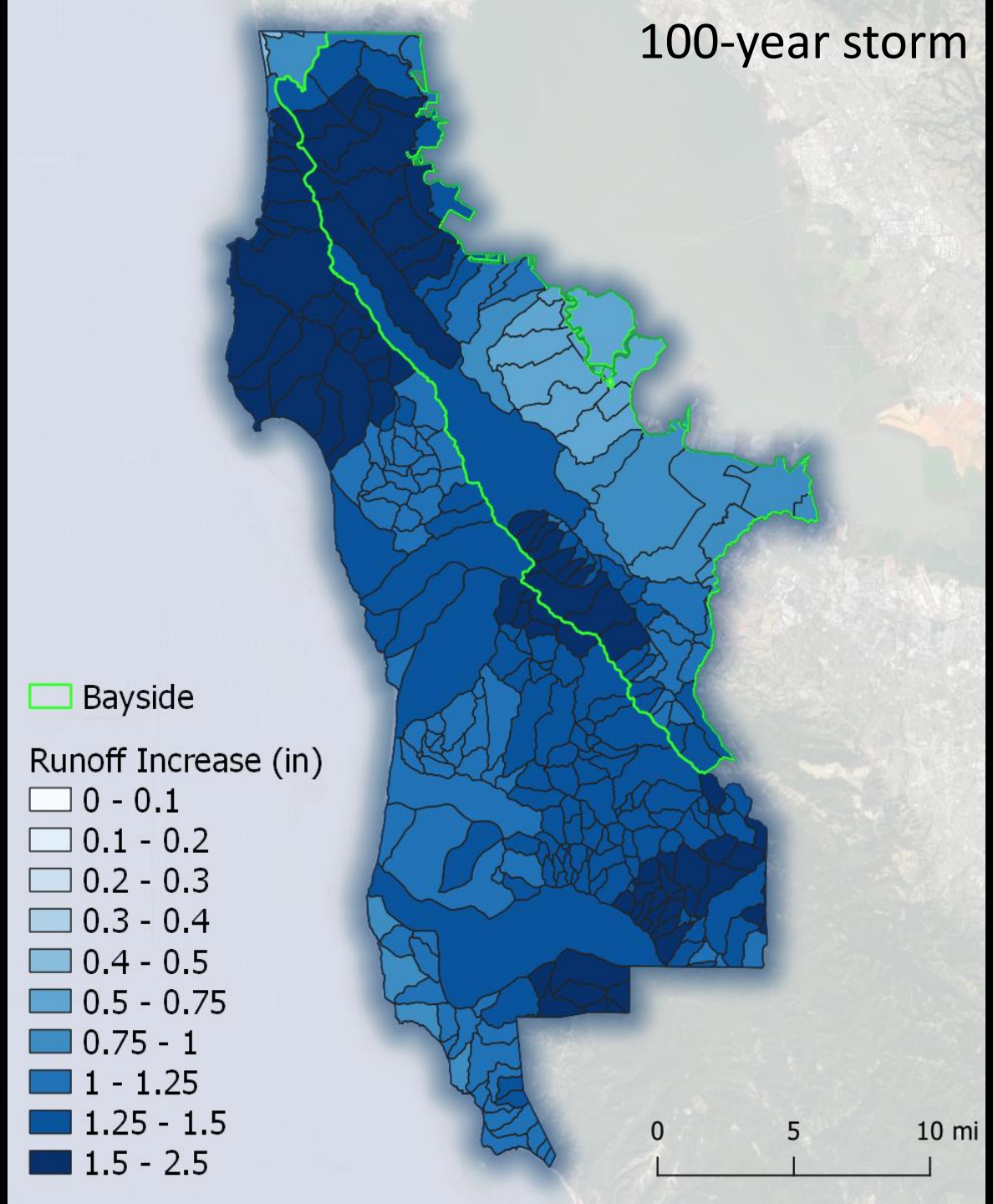

2-year storm
Bayside
Runoff Increase (in)
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.75
0.75 - 1
1 - 1.25
1.25 - 1.5
1.5 - 2.5
0
5
10 mi


5-year storm
Bayside
Runoff Increase (in)
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.75
0.75 - 1
1 - 1.25
1.25 - 1.5
1.5 - 2.5
0
5
10 mi


10-year storm
Bayside
Runoff Increase (in)
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.75
0.75 - 1
1 - 1.25
1.25 - 1.5
1.5 - 2.5
0
5
10 mi


25-year storm
Bayside
Runoff Increase (in)
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.75
0.75 - 1
1 - 1.25
1.25 - 1.5
1.5 - 2.5
0
5
10 mi


50-year storm
Bayside
Runoff Increase (in)
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.75
0.75 - 1
1 - 1.25
1.25 - 1.5
1.5 - 2.5
0
5
10 mi


100-year storm
Bayside
Runoff Increase (in)
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
0.5 - 0.75
0.75 - 1
1 - 1.25
1.25 - 1.5
1.5 - 2.5
0
5
10 mi

Impact on Overall Runoff Depth

Region	Scenario	6-hour Runoff Depth (in.) by Return Period					
		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Ocean	Historical	1.13	1.50	1.79	2.17	2.47	2.77
	Median (RCP 8.5)	1.31	1.80	2.25	2.97	3.56	4.18
	Percent Change	*15%*	*20%*	*26%*	*37%*	*44%*	*51%*
Bayside	Historical	0.97	1.30	1.56	1.90	2.17	2.44
	Median (RCP 8.5)	1.10	1.53	1.94	2.56	3.07	3.62
	Percent Change	*14%*	*17%*	*24%*	*34%*	*41%*	*49%*
Countywide	Historical	1.07	1.43	1.70	2.07	2.36	2.64
	Median (RCP 8.5)	1.23	1.70	2.13	2.81	3.37	3.97
	Percent Change	*15%*	*19%*	*25%*	*36%*	*43%*	*50%*

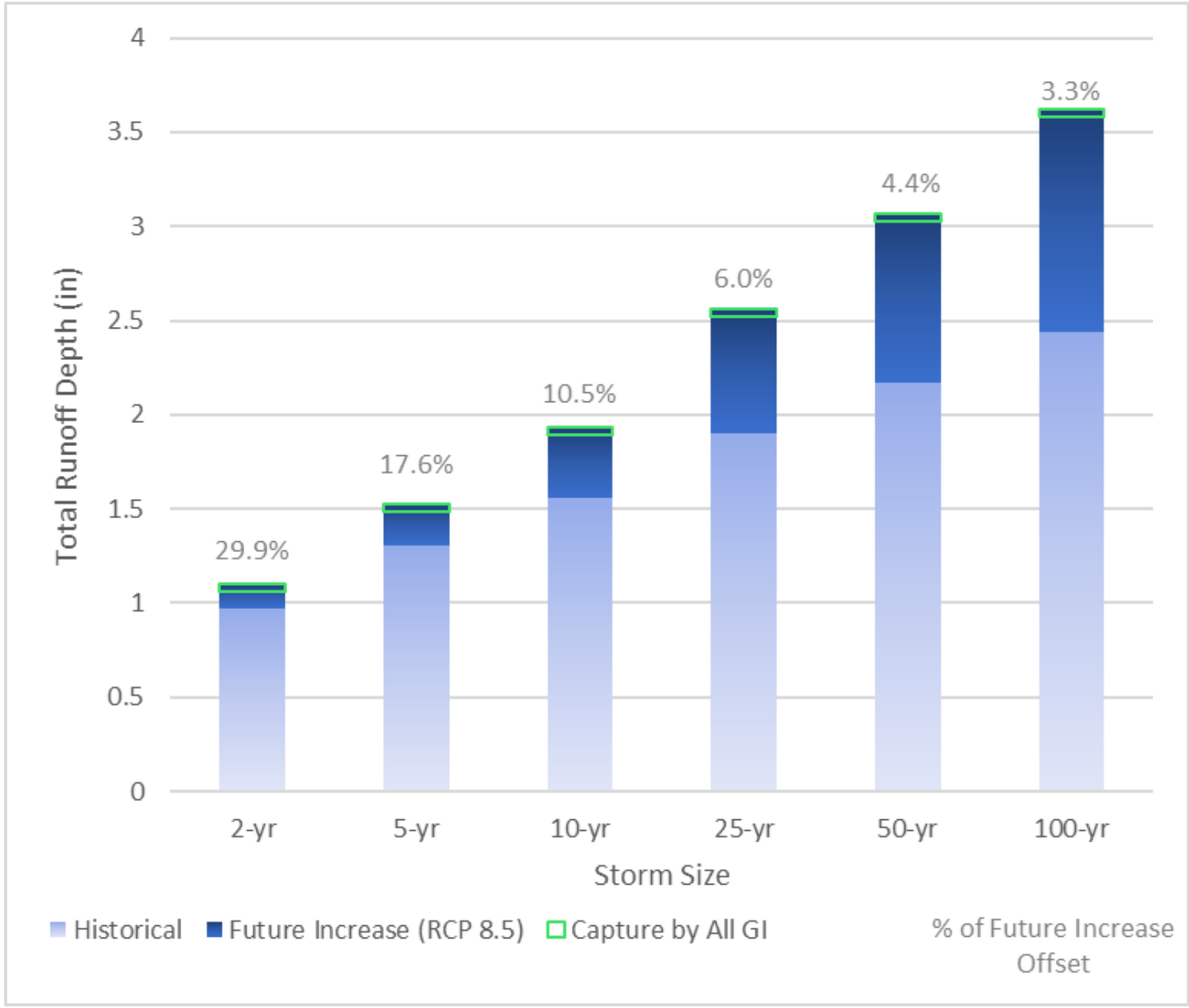
Impact on Roadway Runoff Depth

Region	Scenario	6-hour Runoff Depth (in.) by Return Period					
		2-yr	5-yr	10-yr [1]	25-yr	50-yr	100-yr
Ocean	Historical	0.030	0.037	0.043	0.050	0.055	0.061
	Median (RCP 8.5)	0.033	0.043	0.051	0.065	0.077	0.089
	Percent Change	*12%*	*15%*	*21%*	*30%*	*38%*	*46%*
Bayside	Historical	0.144	0.180	0.206	0.241	0.268	0.295
	Median (RCP 8.5)	0.158	0.203	0.244	0.306	0.355	0.409
	Percent Change	*10%*	*13%*	*18%*	*27%*	*32%*	*39%*
Countywide	Historical	0.074	0.092	0.106	0.124	0.138	0.151
	Median (RCP 8.5)	0.081	0.104	0.126	0.158	0.184	0.212
	Percent Change	*11%*	*14%*	*19%*	*28%*	*34%*	*41%*

[1] There is approximately 20% increase in runoff from the roadway network for the 10-year storm. Storm drain systems in the county are typically sized for the 10-year storm.

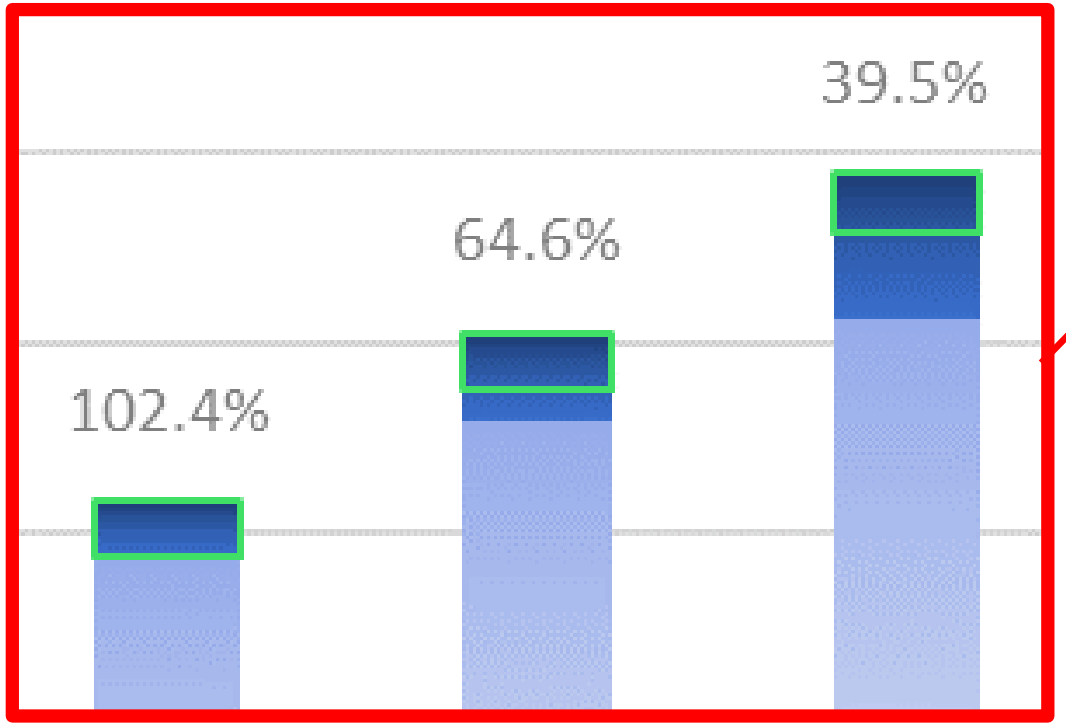
Benefit of ***ALL*** Green Infrastructure on Reducing Runoff

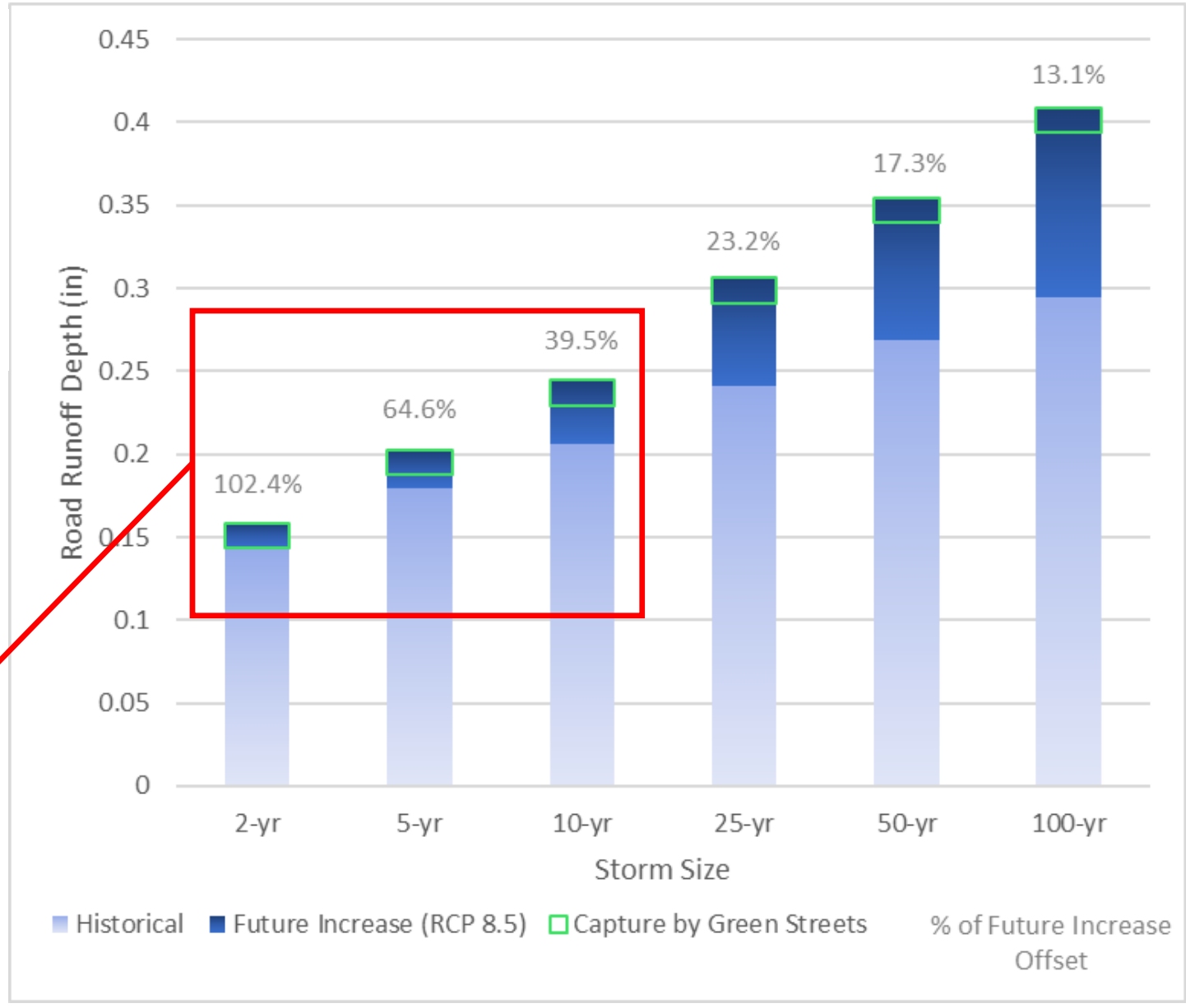
- GI offsets 30% of the projected increase in all runoff for the 2-yr storm
- Benefits of GI decreased with increasing storm size



Benefit of *Sustainable Streets* on Reducing *Road* Runoff

- Sustainable streets offset >100% of the projected increase in roadway runoff for the 2-yr storm
- Benefits of sustainable streets decrease with increasing storm size





A GUIDE TO EATING FISH *from* SAN FRANCISCO BAY

(ALAMEDA, CONTRA COSTA, MARIN, NAPA, SAN FRANCISCO, SAN MATEO, SANTA CLARA, SOLANO, SONOMA COUNTIES)

WOMEN 18 - 45 YEARS AND CHILDREN 1 - 17 YEARS

Eat the Good Fish
Eating fish that are low in chemicals may provide health benefits to children and adults.

Avoid the Bad Fish
Eating fish with higher levels of chemicals like mercury or PCBs may cause health problems in children and adults.

Choose the Right Fish
Chemicals may be more harmful to unborn babies and children.

Women
(18-45 Years)

Children
(1-17 Years)

2 TOTAL SERVINGS A WEEK

OR

1 TOTAL SERVING A WEEK

0 DO NOT EAT

Brown rockfish

Chinook (King) Salmon
high in omega-3s

Jacksmelt

Red rock crab

California halibut

White croaker

Sharks

White sturgeon

Surfperches

Striped Bass

Serving Size
A serving of fish is about the size and thickness of your hand. Give children smaller servings.

For Adults

For Children

Some chemicals are higher in the skin, fat, and guts.

Eat only the skinless fillet

Eat only the meat

California Office of Environmental Health Hazard Assesment

web www.oehha.ca.gov/fish
email fish@oehha.ca.gov
phone (916) 324-7572

Sustainable Streets Master Plan

Transportation Projects

Safe Routes to School/Transit

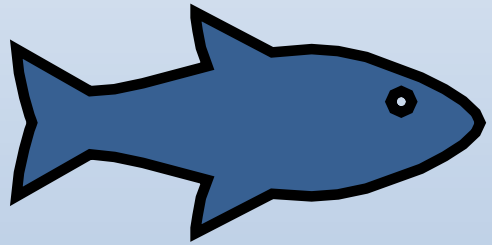
Pavement Maintenance

Green Infrastructure

Project Concepts

Policy Models

Funding



Typology

I	Bulb Outs and Curb Extensions		$	Spot improvements, pedestrian safety	Safe Routes to School Traffic Calming Corridor Vision Zero Plans
II	Connectivity Improvements		$$	Linear projects, bike lane and multi-modal connectivity improvements	Class 1 and 4 Bikeways Road Diets Gap Closure Project Transit Priority Corridor
III	Streetscape Projects		$$$	Complete street improvements in commercial corridors	Main Street Redesign Downtown Reinvestment Corridor Beautification
IV	Frontage Improvements		--	Private development improvements in frontage zone	Development COAs Sustainable Street Policy

Typology I: Green Bulb Outs and Curb Extensions

Typology II: Connectivity Improvements

Typology III: Streetscape Redesign Projects

Typology IV: Frontage Improvements

SSMP Project Prioritization Process

Identify Planned and "New" Project Opportunities

- Define Sustainable Street Typologies
- Find active transportation projects from existing plans
- Find "new" opportunities near schools and transit
- Screen projects based on feasibility to integrate green infrastructure

Prioritize Opportunities

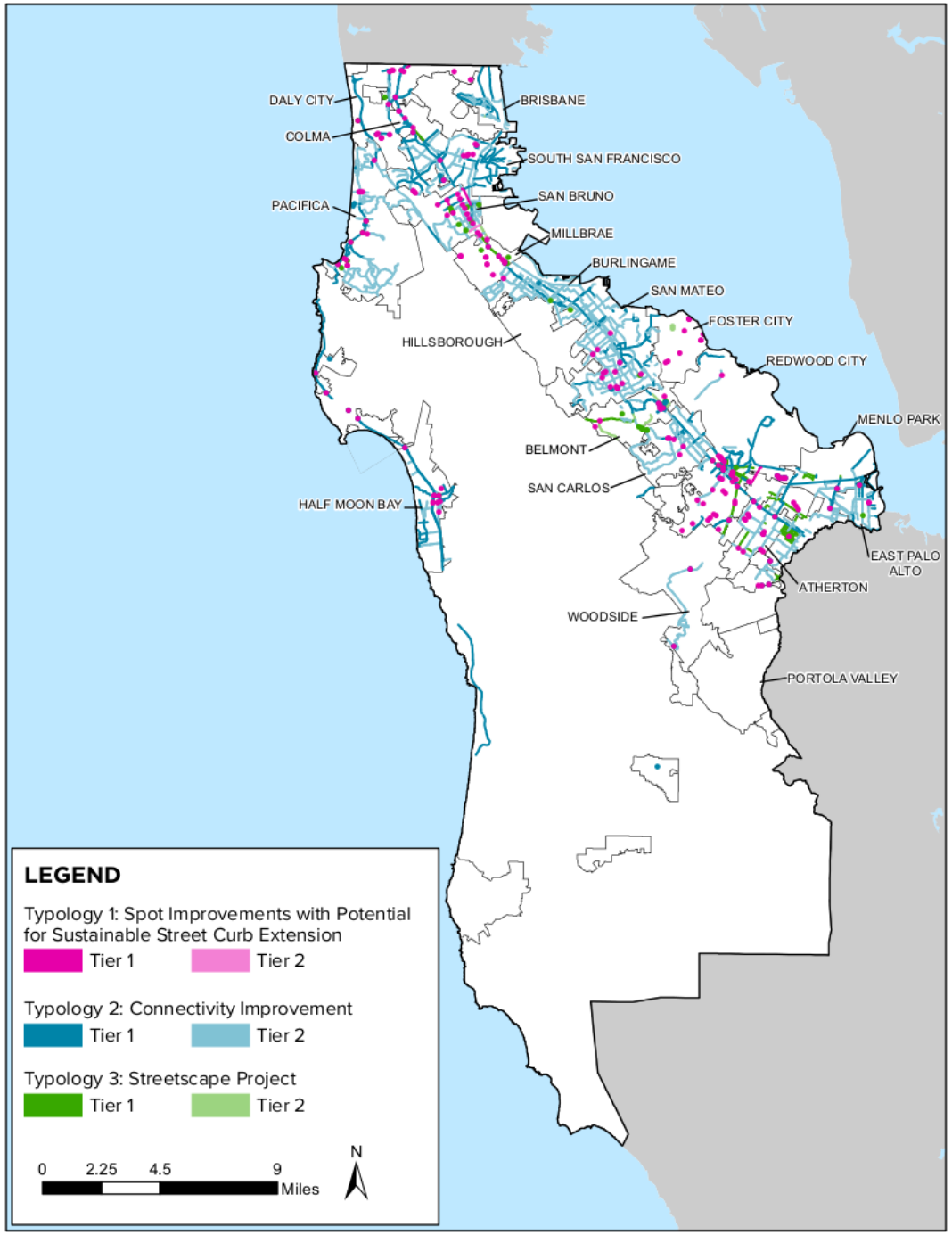
- Pair opportunities with stormwater analysis and community benefit criteria
- Create ranked top opportunity lists for each community

Identify Recommended Projects

- Incorporate stakeholder feedback on project opportunities
- Refine project boundaries
- Develop funding linkages
- Establish project phasing

Develop Project Concepts

- Identify high-priority project opportunities with near-term implementation timelines
- Develop project concepts across typologies
- Create strong visual renderings
- Focus on multiple benefits and planning level cost estimates



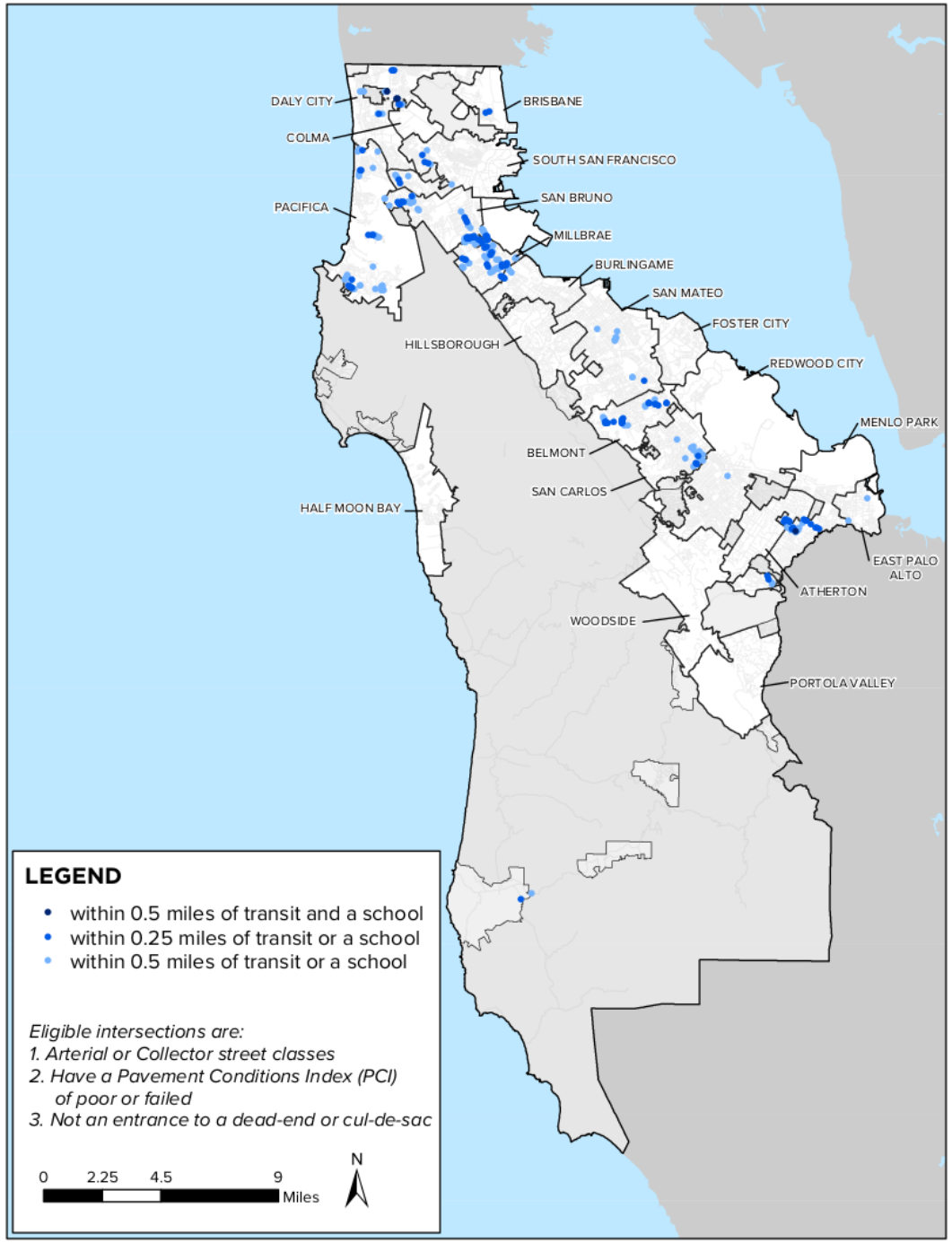
Existing Planned Project Opportunities

Three Project Typologies

- Sustainable Street Curb Extensions
- Sustainable Street Connectivity Improvements
- Sustainable Streetscape Projects

Two Project Tiers

- Tier 1 projects have more potential to cost-effectively incorporate GI due to extent of construction impacts



"New" Project Opportunities

Goals

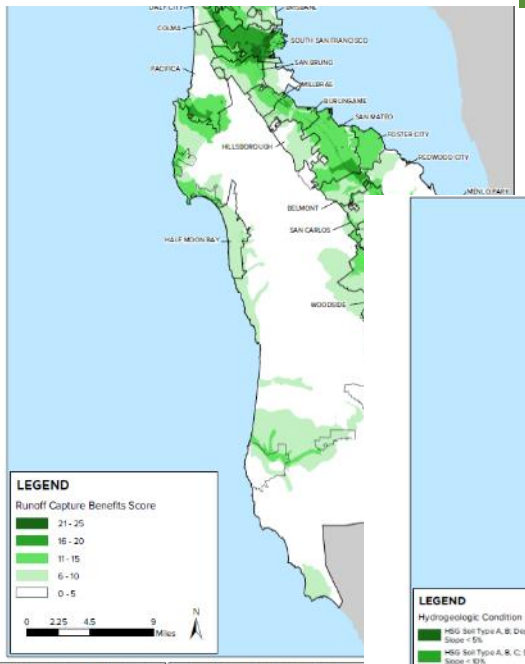
- Support Safe Routes to School and Transit Program objectives
- Support cost-sharing and construction impact reduction objectives by locating opportunities where pavement is in poor condition

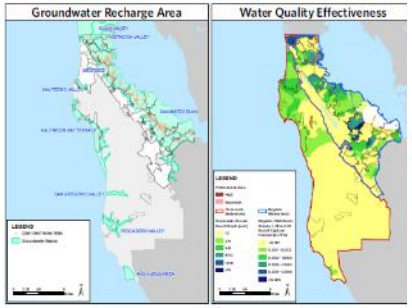
New Curb Extension Opportunities:

- Intersections within 0.5mi walking distance from schools or major transit stops
- Arterial or collector streets
- Poor pavement condition

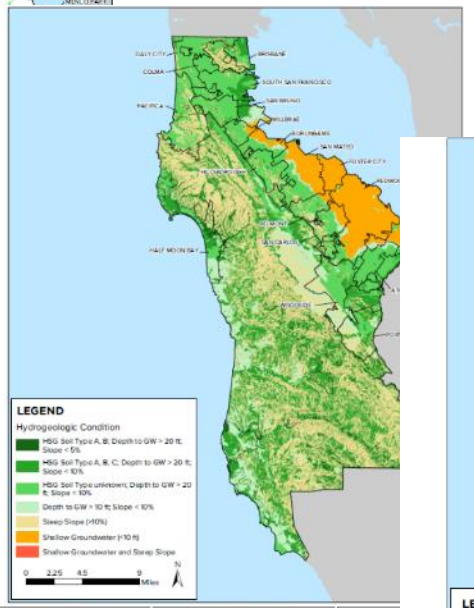
Technical Suitability Results

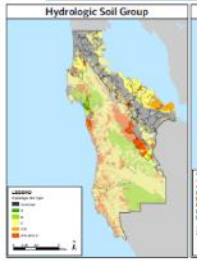
Runoff Capture Spatial Effectiveness +



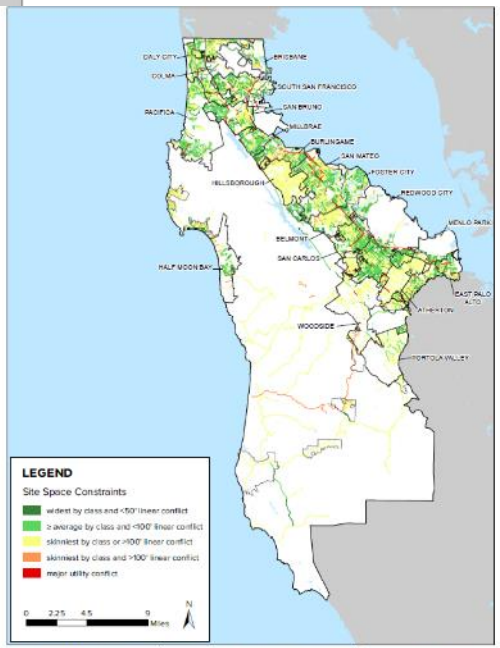


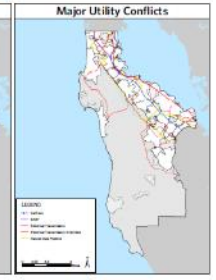
Infiltration Feasibility +





Site Space Constraints +





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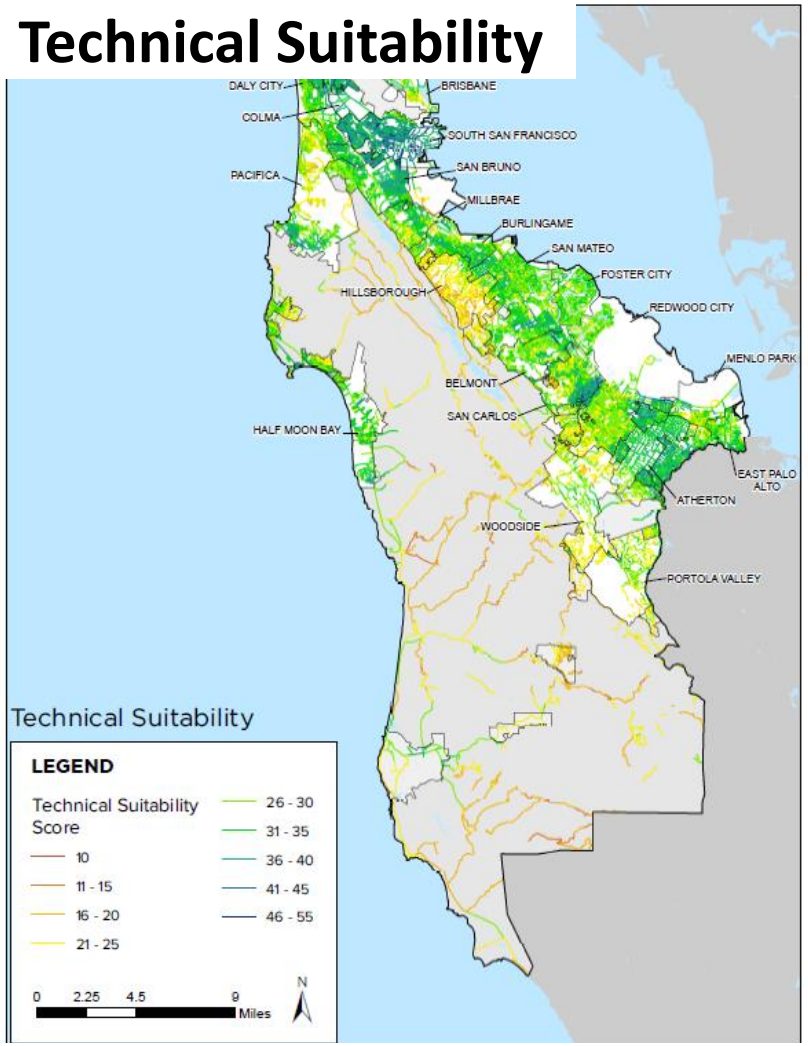
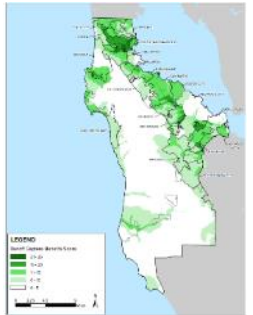
Technical Suitability



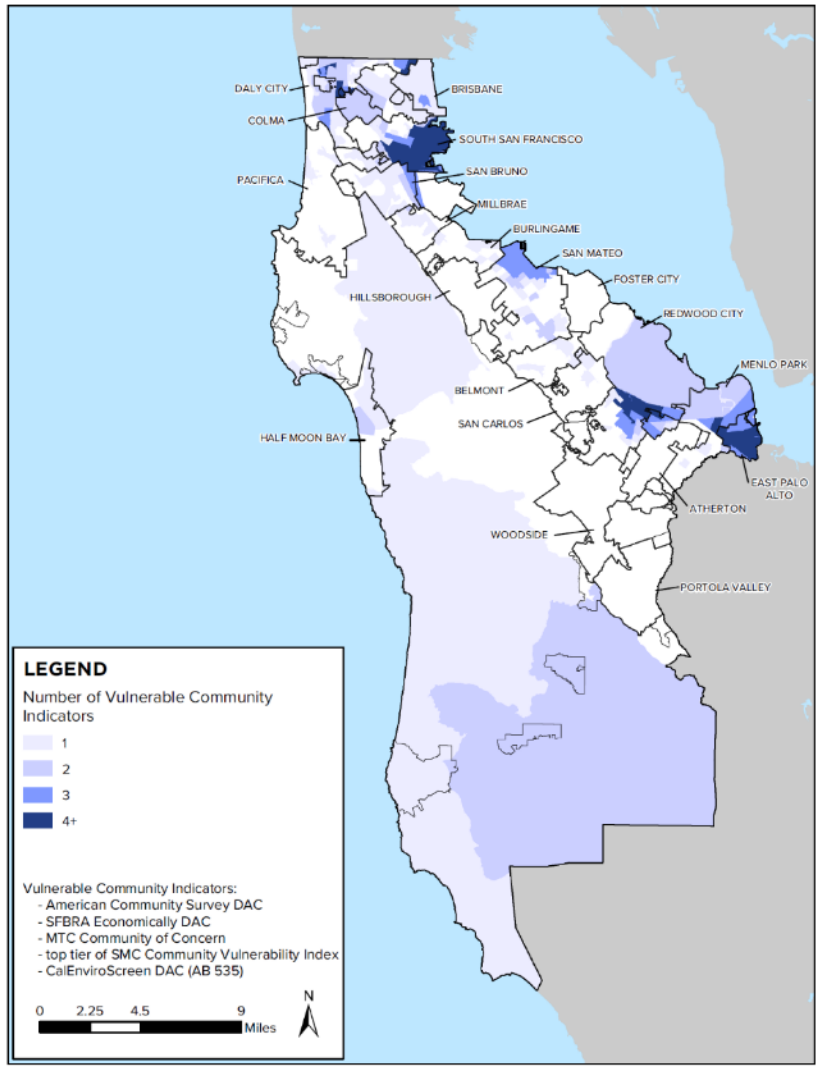
Runoff Performance



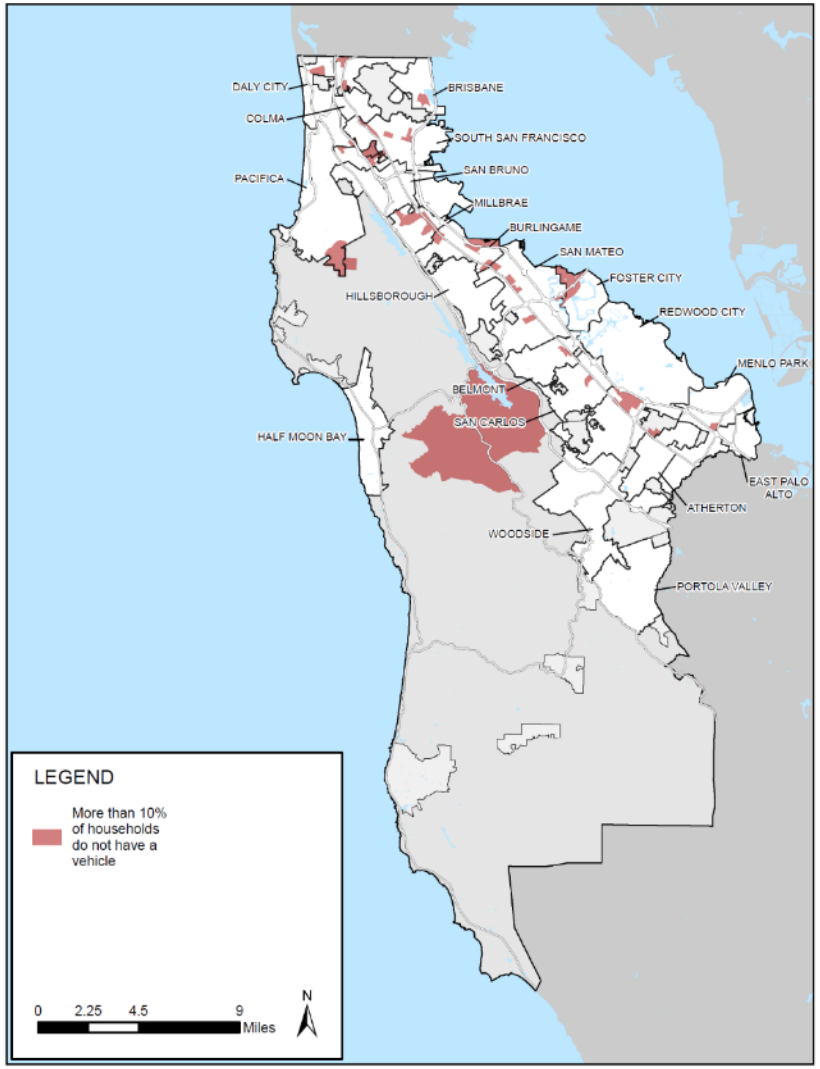
Infiltration Feasibility

Site Space Constraints

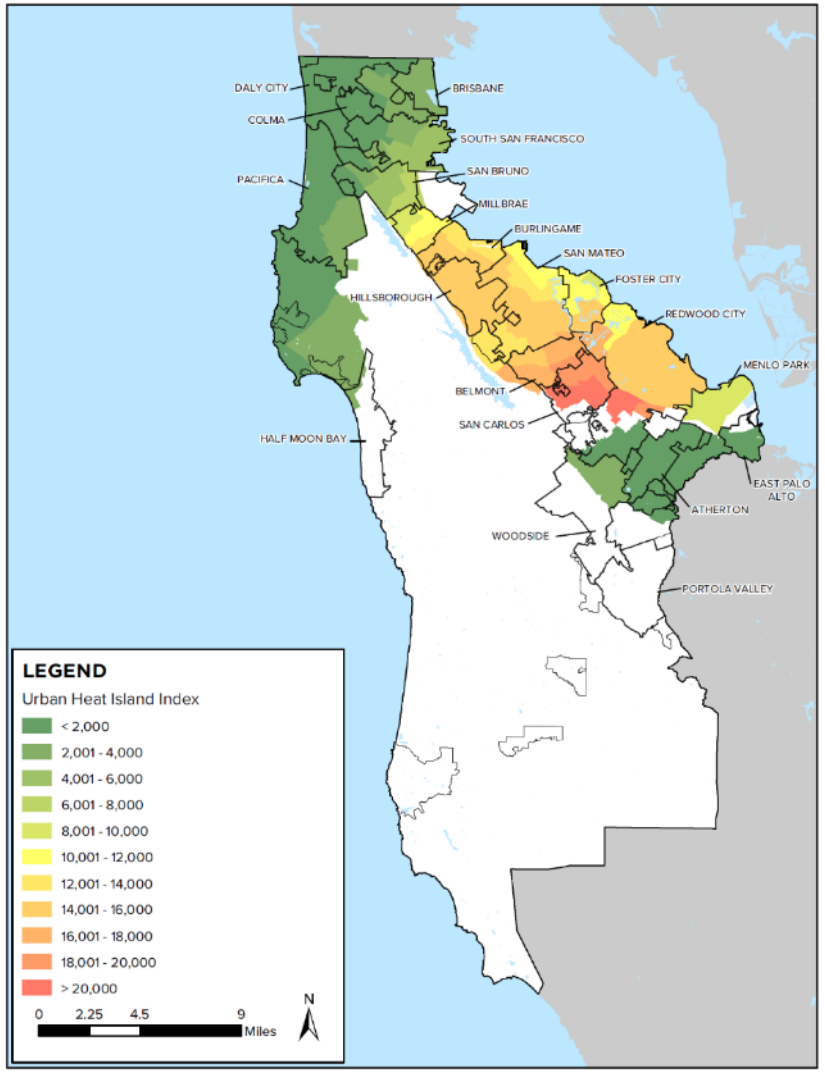
Co-Benefit Criteria



Vulnerable Community Indices

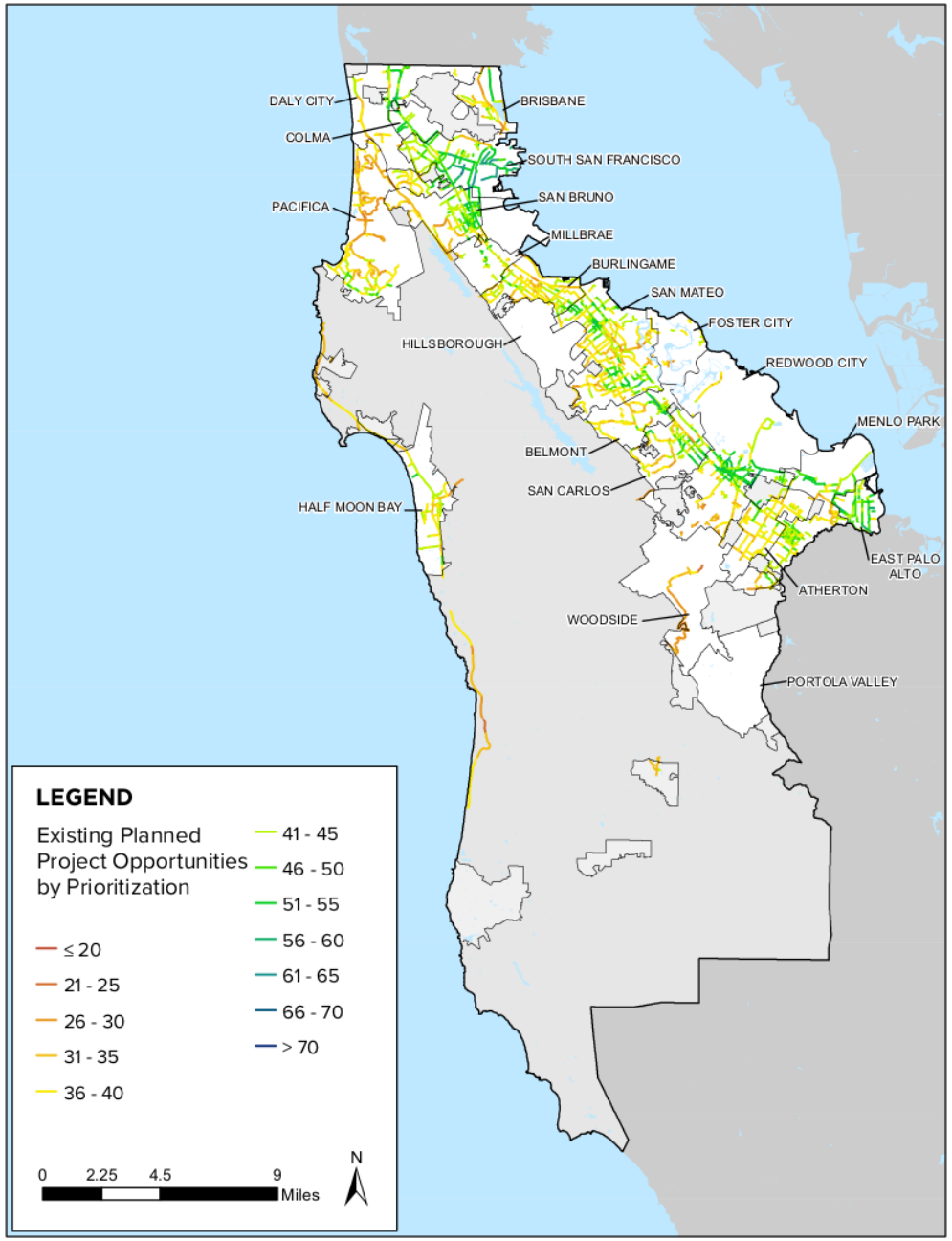


Low Vehicle Ownership

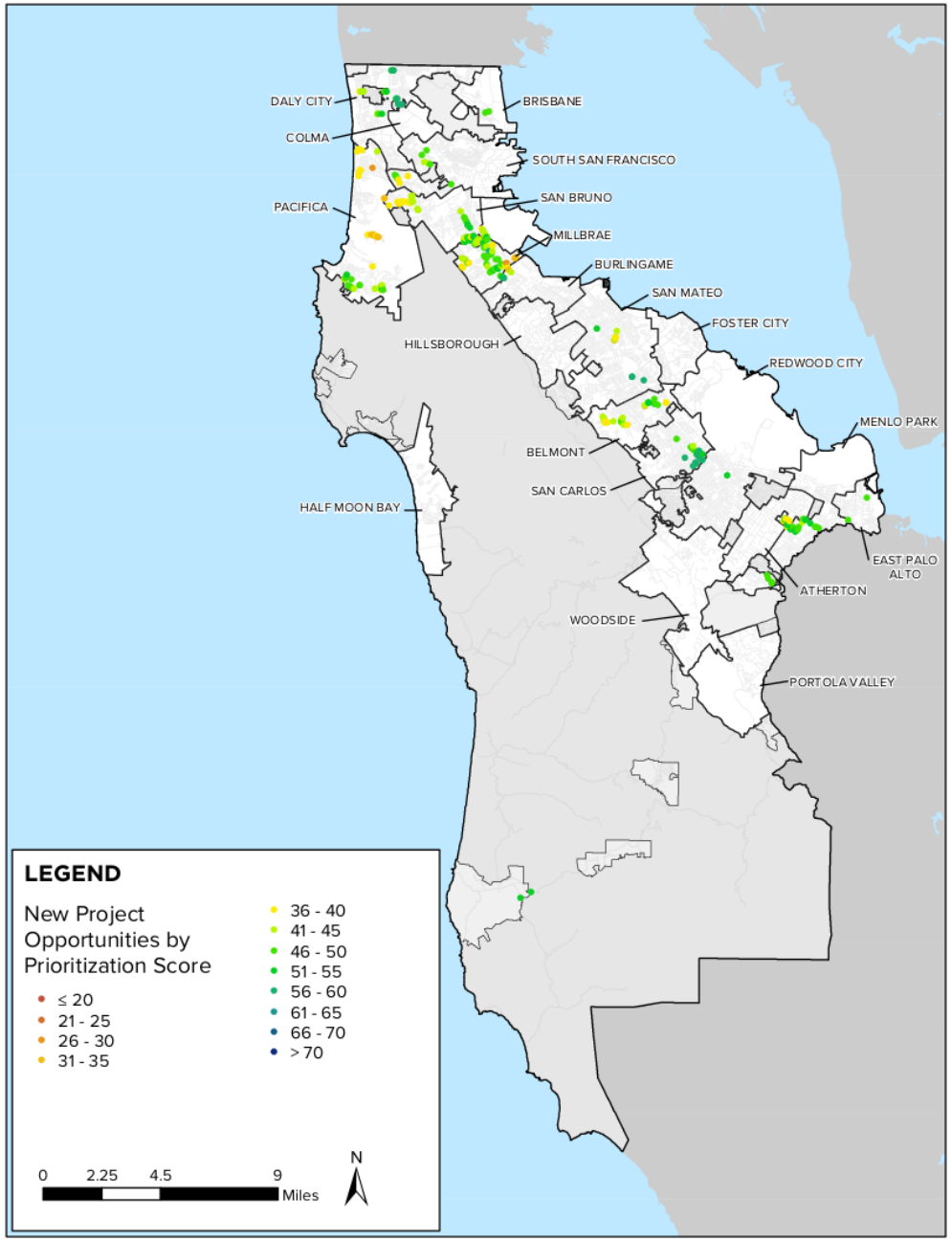


Urban Heat Island Index

Prioritized Planned Projects



Prioritized New Opportunities



El Camino Real Colma

Concept Description

El Camino Real (State Highway 82) through the Town of Colma is being redesigned with pedestrian and bicycle improvements. The design includes new landscaping, the addition of a protected bike lane in both directions, new signaling, and a lane reduction from C Street to Mission Street. This concept proposed to integrate green stormwater infrastructure in the planned transportation improvements.

The proposed vegetated median separating the bike lanes from vehicular traffic is 5 to 6 feet wide. At T-intersections and at intersection approaches the proposed median widens to 10 to 13 feet. Portions of the vegetated median on the northeast side of El Camino Real can be installed as bioretention facilities that collect and manage stormwater runoff from the roadway, bike lanes, and sidewalks. The remaining portions of the median can be landscaped with trees and graded to direct flow towards the bioretention areas. The proposed median on the southwest side of El Camino Real is located above a water main making bioretention facilities infeasible.

The bioretention facilities are shown for the block extending north of Collins Road representing a typical block within the corridor. The same design can be applied to the full extent of improvement from C Street through Mission Street. The proposed bioretention facilities shown on the typical block represent 3,300 square feet of facilities. This project will manage stormwater from 1.9 acres of roadway and provide capture of 3.5 acre-feet of runoff per year. The project is expected to retain approximately 68.6% of runoff.

Site Characteristics

In Priority Development Area
Yes

Pavement Condition Index
Not Available

Watershed
Colma Creek

Green Infrastructure Performance

Drainage Management Area
1.9 ac

Annual Runoff Captured
3.5 ac-ft

Bioretention Area / Storage Volume
3,300 sf / 0.10 ac-sf

Active Transportation Performance

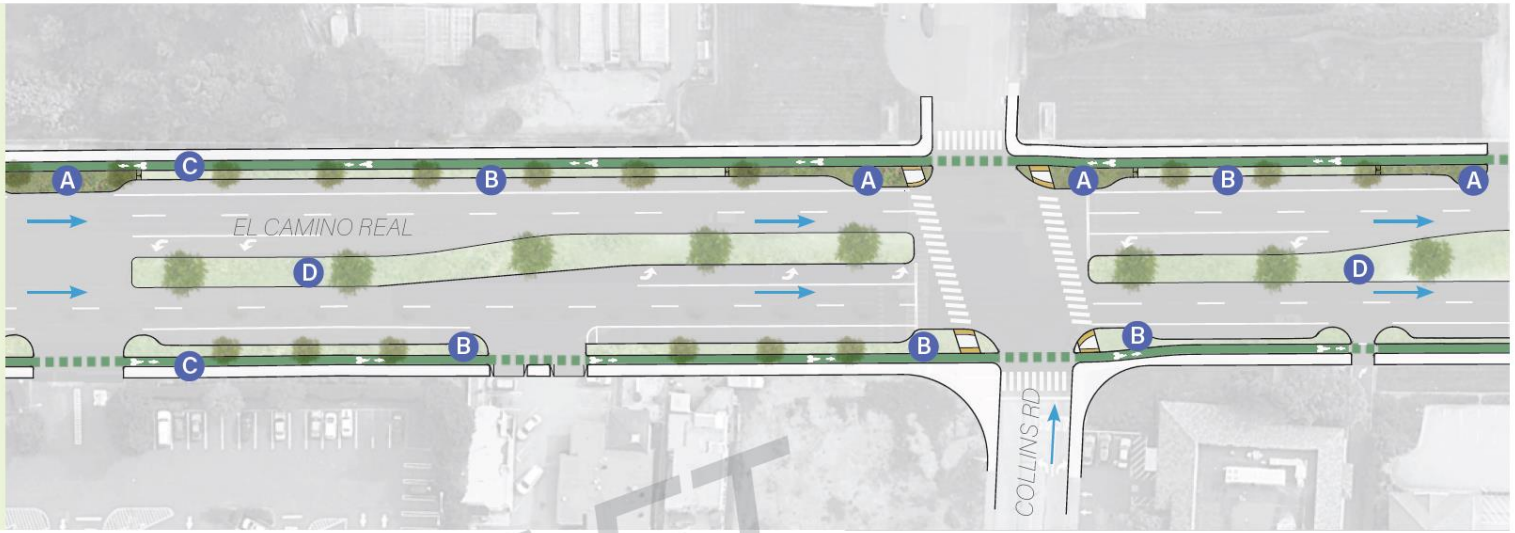
Change in Bicycle Level of Traffic Stress (LTS) [🔗]
LTS 4 to LTS 1

Increase in % Likely Bicyclist Usage
99%

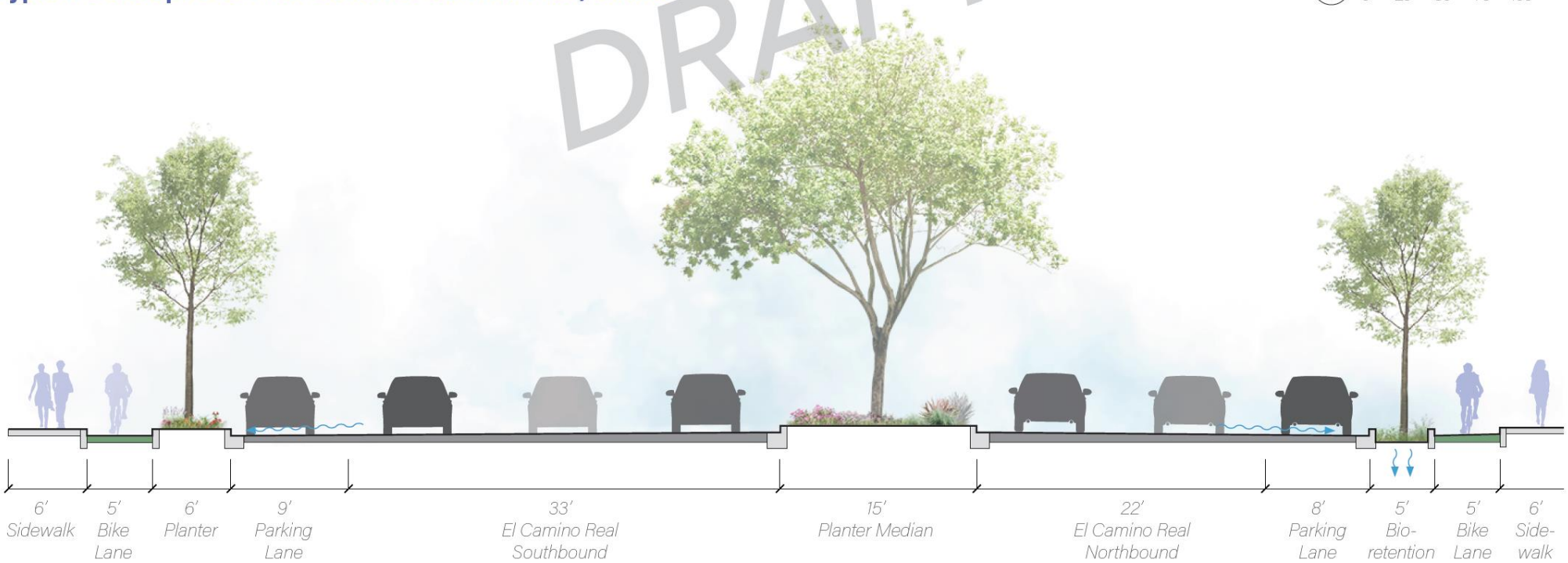
Key Transportation Benefits
- *Reduced pedestrian crossing distance*
- *Protected bike space*
- *Road diet*

KEY SITE IMPROVEMENTS

- **A** *Proposed bioretention planter*
- **B** *Proposed planter buffer*
- **C** *Proposed protected bike lane*
- **D** *Existing planter median*



Typical Concept Site Plan Detail: El Camino Real, Colma



Typical Cross Section Detail: El Camino Real

San Mateo Countywide Sustainable Streets Master Plan

Rollins Road Burlingame

Concept Description

The Burlingame General Plan identifies Rollins Road as an area that will be targeted for growth and reinvention as a more diverse mixed-use neighborhood with access to transit. As part of this change the city is proposing a road diet and the addition of a class IV bike lane with separated parking to support pedestrian and bicycle activity. This concept proposed to integrate green stormwater infrastructure with the planned transportation improvements.

Linear bioretention planters are proposed as the barrier between the bike lane and driving lane on the south side of Rollins Road. Linear bioretention planters are proposed on the north side of Rollins Road at strategic locations within the parking lane to protect pedestrian crossings and driveways. These bioretention planters will capture stormwater runoff from the roadway and sidewalk. A total of 4,400 square feet of bioretention planter and 6,000 square feet of permeable pavement is proposed, managing stormwater from approximately 3.5 acres of roadway. This project is expected to capture 6.3 acre-feet of runoff per year and retain approximately 69% of runoff.

Site Characteristics

In Priority Development Area
Yes

Watershed
El Portal Creek, Mills Creek, & Easton Creek

Green Infrastructure Performance

Drainage Management Area
3.5 ac

Annual Runoff Captured
6.3 ac-ft

Bioretention Area / Storage Volume
4,400 sf / 0.15 ac-sf

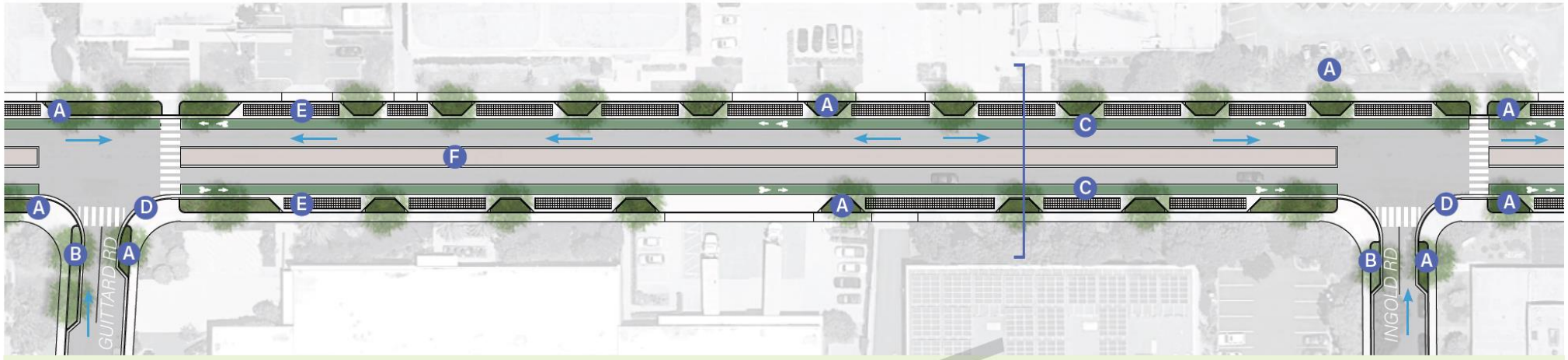
Permeable Pavement Area / Storage Volume
6,000 sf / 0.08 ac-ft

Active Transportation Performance

Change in Bicycle Level of Traffic Stress (LTS) [🔗]
LTS 4 to LTS 3

Increase in % Likely Bicyclist Usage
6%

Key Transportation Benefits
- » *Reduced pedestrian crossing distance*
- » *Protected bike space*
- » *Traffic calming*

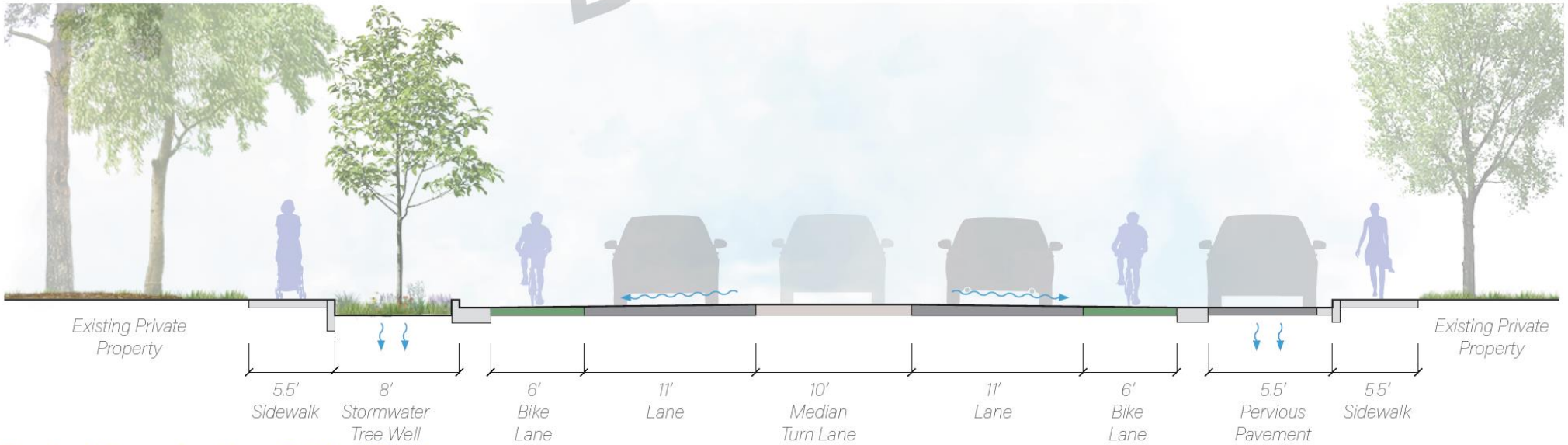


KEY SITE IMPROVEMENTS

- A *Proposed stormwater tree well*
- B *Proposed planter buffer*
- C *Proposed bike lane*
- D *Proposed crosswalk curb extension*
- E *Proposed permeable parking lane*
- F *Proposed colored pavement turn lane*

Typical Concept Site Plan Detail: Rollins Road, Burlingame

0 25' 50' 75' 100'



Typical Cross Section: Rollins Road

Grand Avenue South San Francisco

Concept Description

South San Francisco has a goal to revitalize, improve, and support the downtown area. The City plans to improve circulation and connectivity and to create an attractive and vibrant pedestrian environment along the Grand Avenue corridor. This sustainable street concept envisions a reconfiguration of Grand Ave between Maple Ave and Linden Ave with increased pedestrian spaces and integrated stormwater management within green infrastructure facilities.

This project would realign parking from angles to parallel on both sides of Grand Ave to allow space for a bike lane and increased pedestrian areas. The parking lane is proposed to be permeable pavement which will provide infiltration of runoff. The mid-block area is proposed to include a wider sidewalk and colored paving within the driving lanes to promote traffic calming and increased pedestrian safety. Sidewalk and pedestrian spaces will be installed as boardwalks overlaying bioretention planters. This will provide large stormwater facilities that can manage roadway and sidewalk runoff while preserving space for pedestrian use along the busy commercial and mixed-use corridor. Street trees will be integrated along the parking lane and within the pedestrian boardwalk.

A total of 5,600 square feet of permeable pavement is proposed and a total of 10,200 square feet of bioretention planter integrated in boardwalks are proposed. These are estimated to capture stormwater runoff from approximately 1.2 acres of roadway, providing capture of 2.5 acre-feet of runoff per year. This project is expected to retain 68% or runoff.

Site Characteristics

In Priority Development Area
Yes

Watershed
Colma Creek

Green Infrastructure Performance

Drainage Management Area
1.2 ac

Annual Runoff Captured
2.5 ac-ft

Bioretention Area / Storage Volume
10,200 sf / 0.35 ac-ft

Permeable Pavement Area / Storage Volume
5,600 sf / 0.08 ac-ft

Active Transportation Performance

Change in Bicycle Level of Traffic Stress (LTS) [🔗]
LTS 4 to LTS 3

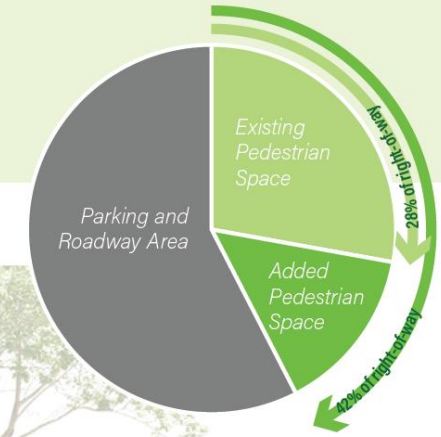
Increase in % Likely Bicyclist Usage
11%

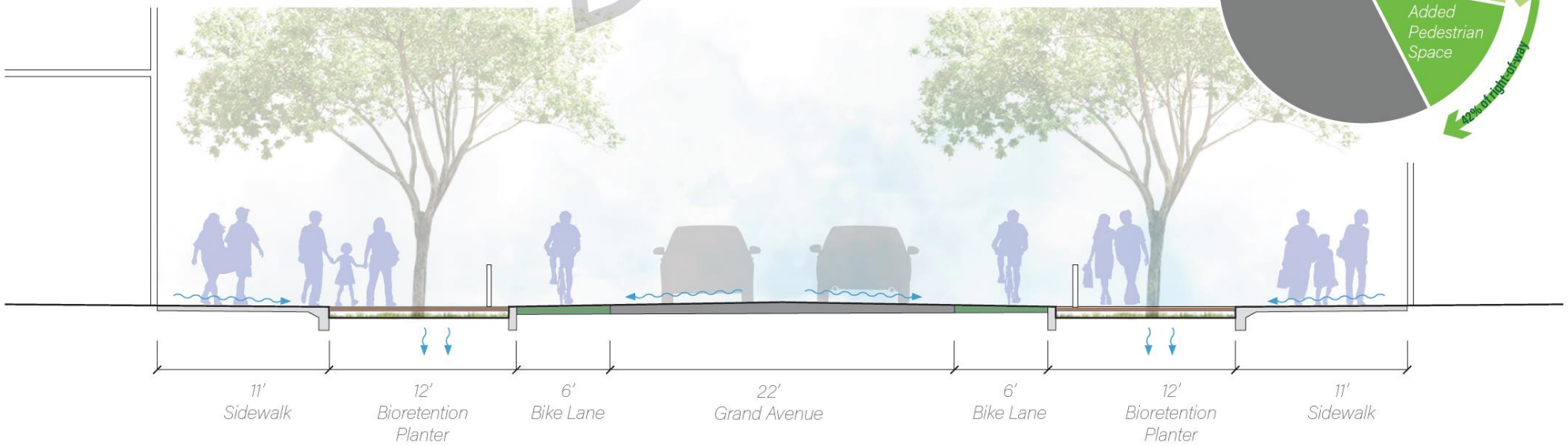
Key Transportation Benefits
- *Reduced pedestrian crossing distance*
- *Increased pedestrian space*
- *Traffic calming*
- *Added bike lane*

KEY SITE IMPROVEMENTS

- A *Proposed bioretention planter*
- B *Proposed suspended pavement over bioretention planter*
- C *Proposed permeable pavement*
- D *Proposed bike lane*
- E *Proposed plaza crossing*
- F *Existing bus stop*

Concept Site Plan Detail: Grand Avenue, South San Francisco





Typical Cross Section a-a: Grand Avenue


ARIEL ACCESSORIES

Santa Cruz Avenue Menlo Park

Concept Description

Menlo Park has described in their Downtown Specific Plan a desire to renovate Santa Cruz Avenue to create more usable public space, an interest in closing parts of the street for temporary events such as Farmers Markets, and a goal of protecting and enhancing pedestrian amenities. This sustainable street concept proposes a reconfiguration of the street between University Drive and Crane Street to increase pedestrian use spaces and integrate stormwater management within green infrastructure.

On the west side of Santa Cruz Ave, the parking lane is proposed to be realigned from angled parking to parallel parking to increase the available pedestrian space. The parking lane is proposed as permeable pavement with street trees dividing every two spaces. The permeable pavement will infiltration runoff from the street and direct excess flows to the adjacent bioretention planters.

The bioretention planters will integrate vegetation into the pedestrian parklet areas. A permeable boardwalk is proposed that will allow sidewalk runoff to drain to bioretention areas located below the boardwalk. The boardwalk bioretention and bioretention planters will be connected to provide infiltration of runoff from the street, sidewalk, and parking areas. On the east side of Santa Cruz Ave, a similar system of bioretention planters and boardwalks is proposed to provide management of roadway and sidewalk runoff while providing increased pedestrian space.

A total of 2,450 square feet of permeable pavement is proposed and a total of 7,800 square feet of bioretention planter/boardwalks are proposed. These are estimated to manage stormwater runoff from approximately 1.9 acres of roadway, sidewalk, and adjacent roofs, providing capture of 3.6 acre-feet of runoff per year.

Site Characteristics

In Priority Development Area
Yes

Pavement Condition Index
At Risk

Watershed
Ravenswood Slough

Green Infrastructure Performance

Drainage Management Area
1.9 ac

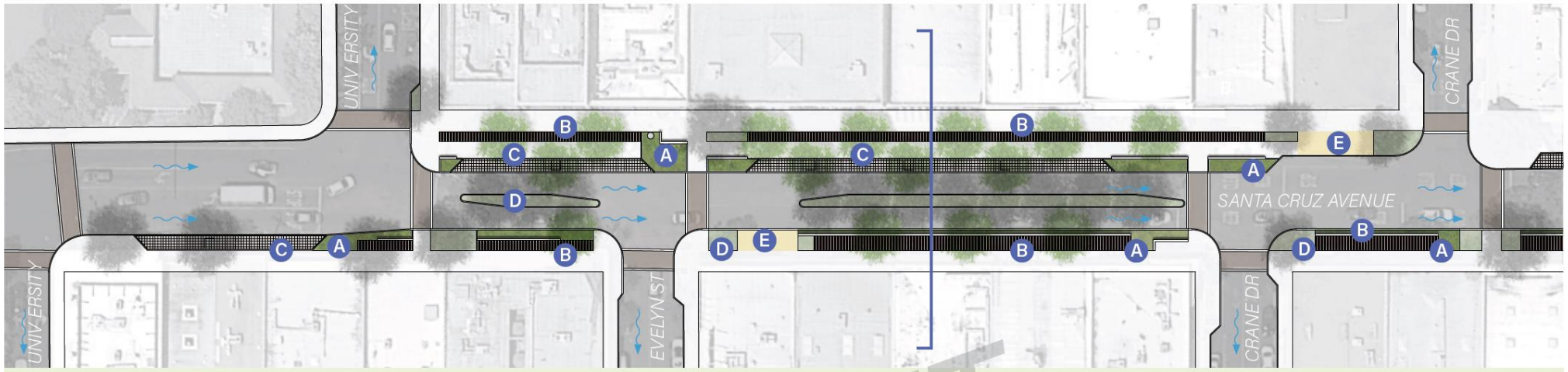
Annual Runoff Captured
3.6 ac-ft

Bioretention Area / Storage Volume
7,800 sf / 0.2 ac-ft

Permeable Pavement Area / Storage Volume
2,450 sf / 0.03 ac-ft

Active Transportation Performance

Key Transportation Benefits
- *Reduced pedestrian crossing distance*
- *Traffic calming*

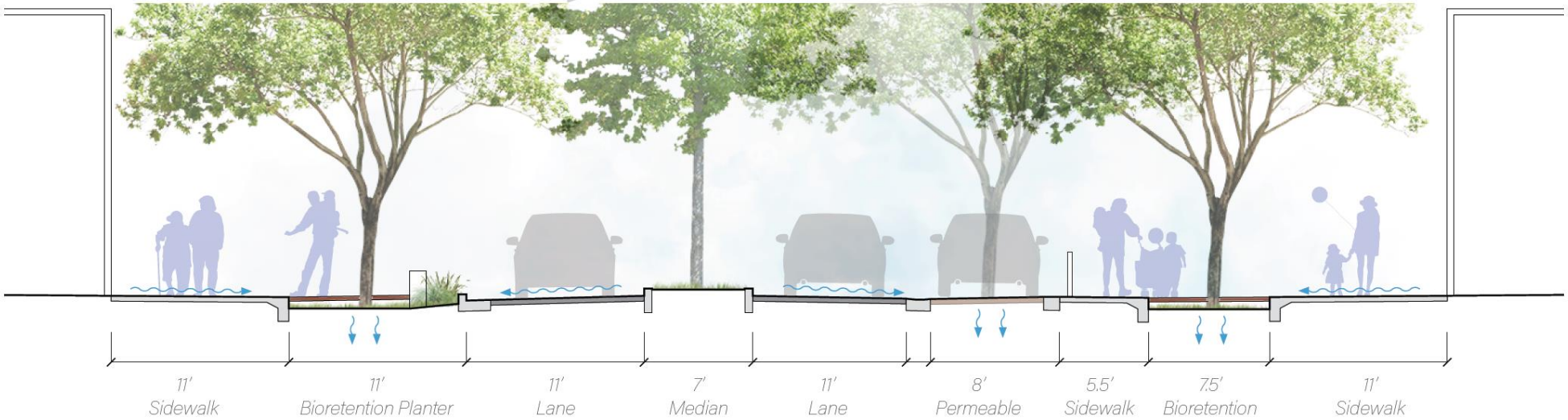


KEY SITE IMPROVEMENTS

- A *Proposed bioretention planter*
- B *Proposed boardwalk over bioretention planter*
- C *Proposed permeable pavement*
- D *Proposed planter buffer*
- E *Proposed bus stop loading zone*

Concept Site Plan Detail: Santa Cruz Avenue, Menlo Park

0 20′ 40′ 60′ 80′



Typical Cross Section: Santa Cruz Avenue


STOP

Sustainable Street Project Typology	Relative Project Cost	Potential Funding Sources
Typology 1 *Sustainable Street Curb Extensions*	$	• Caltrans Active Transportation Program (ATP) • Safe Routes to School • Transportation Development Act, Article 3 (TDA 3)
Typology 2 *Sustainable Street Connectivity Improvements*	$$-$$$	• Affordable Housing and Sustainable Communities (AHSC) • Caltrans Active Transportation Program (ATP) • Caltrans Highway Safety Improvements (HSIP) • Measure A, M, W • One Bay Area Grant Program (OBAG) • Stormwater Grant Program (SWGP)[2] • TIGER grants • Transportation Development Act, Article 3 (TDA 3) • Transportation Fund for Clean Air (TCFA)
Typology 3 *Sustainable Streetscape Redesign Projects*	$$$$	• Affordable Housing and Sustainable Communities (AHSC)[3] • California Natural Resources Agency Urban Greening Grant • Caltrans Active Transportation Program (ATP)[3] • Measure A[3] • One Bay Area Grant Program (OBAG) • Stormwater Grant Program (SWGP)[2] • Transportation for Livable Communities (TLC)[3]
Typology 4 - *Frontage Improvements for New Developments*	--	• Affordable Housing and Sustainable Communities (AHSC) • Private Developers

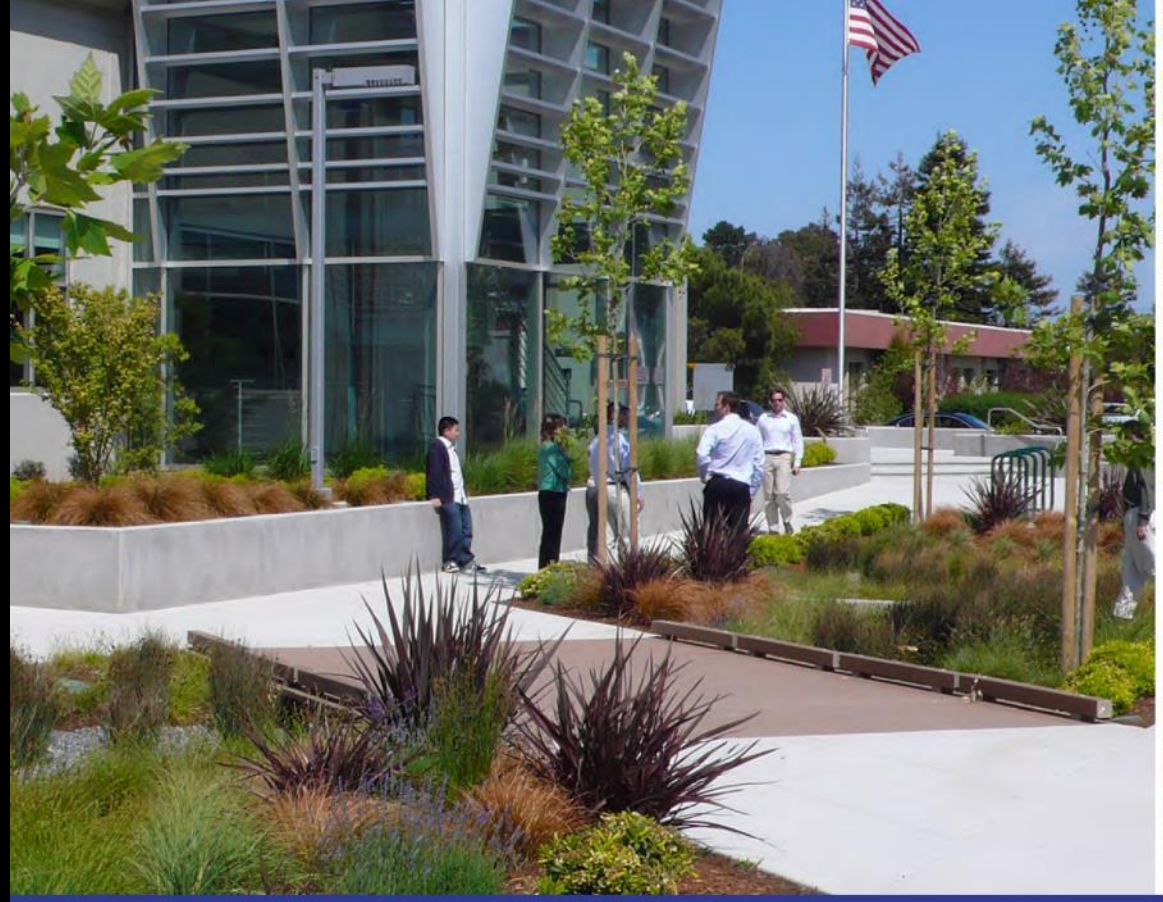
Tools for the Future

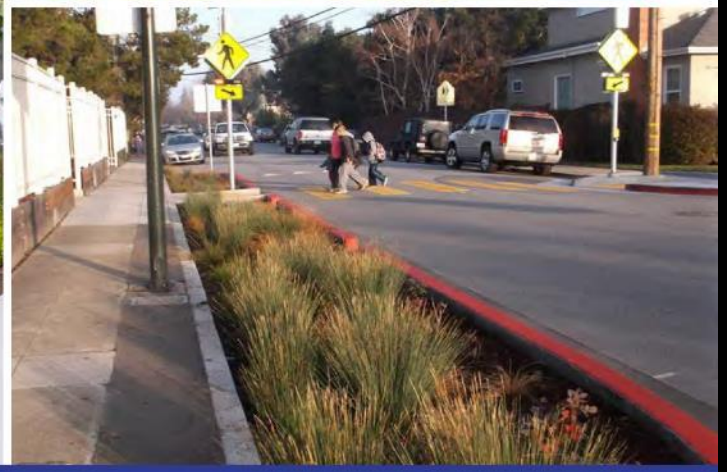
Street scale

- *GI Design Guide – Operations and Maintenance resources
- Drainage area assessment tool
- Stormwater curb extension assessment tool
- Sustainable Streets Typical Details
- Project Concepts and templates

Watershed/Countywide scale

- Web-based Mapping and Tracking Tool
- Sustainable Streets Model Policies
- *GI Design Guide – Sustainable Streets guidance





Green Infrastructure Design Guide

Second Edition | 2020

SAN MATEO COUNTYWIDE
Water Pollution
Prevention Program
Clean Water. Healthy Community.

Table of Contents

NOTE: This document contains interactive elements to help make navigation between subject areas easier. Simply click on the chapter you wish to view on the overhead navigation bar or click through the provided table of contents or indices. Return to this complete table of contents by clicking the arrow symbol on the left edge of the overhead navigation bar. If printing this document, the overhead navigation bar will disappear in the paper version.

KEVIN ROBERT PERRY

Table of Contents

◀ *California poppies blanket a stormwater curb extension along Hillside Boulevard in South San Francisco.*
Photo Credit: Urban Rain|Design

The Donnelly Avenue Green Street and Parking Lot Project in Burlingame, California. ▶
Photo Credit: Urban Rain|Design

3.6 Sustainable Streets Design Examples

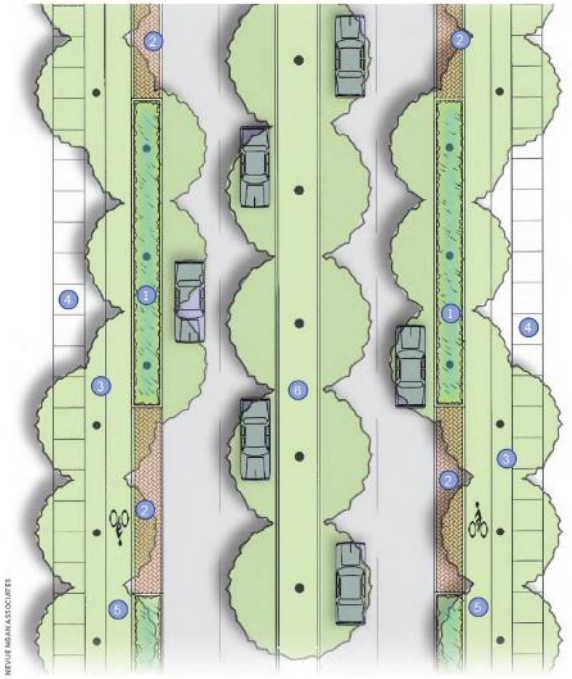
▲ *EXISTING: A typical multi-lane throughway's under-utilized paved shoulder in San Mateo County.*

▲ *EXAMPLE: Pavement materials and colors distinguish raised two-way cycle track and adjacent sidewalk. Landscape buffer from plaza and street.*

Commercial Throughway with Stormwater Planters and Protected Cycle Track

In some conditions along throughways, there is extra paved shoulder space that can be converted into stormwater planters or curb extensions. Depending on how much space there is, it is also possible to introduce a new bike lane or separated cycle track, also known as a protected bike lane, next to the stormwater facilities. Using such an approach helps reinforce the concept of providing more comfortable and family-friendly alternative transportation facilities in concert with managing stormwater runoff treatment. The illustration below showcases this green streets and complete concept.

▲ *RETROFIT OPPORTUNITY: The same street retrofitted with a series of stormwater planters and pervious pavement, a separated cycle track, and additional street trees.*



Key Design Elements

1. Stormwater planters are placed periodically to capture runoff from the roadway.
2. Pervious paving is used in-between stormwater planters.
3. Conventional landscape strip with street trees.
4. Sidewalk.
5. Buffered and protected bike lanes/cycle track.
6. Conventional center landscape median.

▲ *EXAMPLE: Raised two-way cycle track and adjacent sidewalk separated from street by landscaping and stormwater attenuation.*

3.6 Sustainable Streets Design Examples

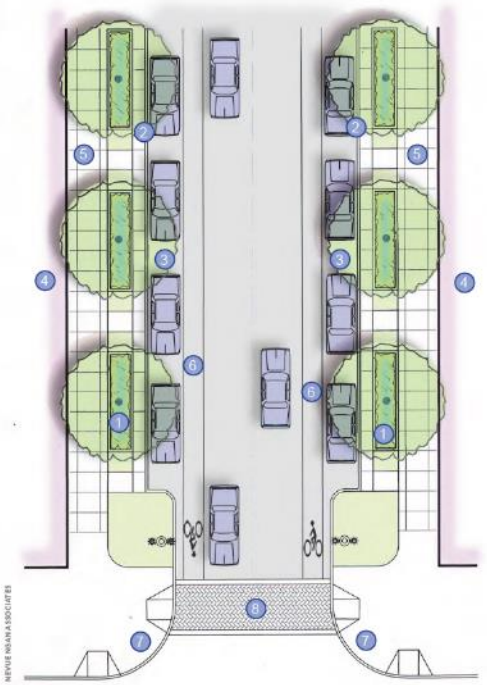
▲ *EXISTING: A mixed use connector street in San Mateo County with on-street parking.*

▲ *EXAMPLE: This stormwater planter provides efficient treatment area in a constrained urban downtown. Pedestrian circulation can be improved by locating parking meters out of the path of travel or using a ticket dispensing system that is not reliant upon pole mounted meters.*

Mixed Use Connector with Stormwater Planter along Parking Lane

Stormwater planters can be added between the outside edge of the sidewalk and the curb, while retaining on-street parking. Pedestrian circulation between parked vehicles and frontage uses can be accommodated by creating walkways in between the planters and a pedestrian step out area adjacent to the on-street parking. The retrofit opportunity illustrated below links a series of infiltration planters. As the upstream stormwater planter fills up with runoff, it overflows out onto the street and enters the next downstream planter. In urban areas, using stormwater planters is advantageous because they allow for stormwater treatment in constrained spaces. Stormwater planters provide a buffer to pedestrians from fast moving vehicles. In addition, the inclusion of stormwater corner bulbouts and striped bicycle lanes should be considered to provide improved complete street benefits and additional stormwater management and treatment.

▲ *RETROFIT OPPORTUNITY: The same mixed use connector retrofitted with stormwater planters that still provide on-street parking.*



Key Design Elements

1. Stormwater planters allow for on-street parking with a step out area for people to access their vehicles and the sidewalk.
2. Grated curb cuts allow runoff to enter/exit the stormwater facility.
3. On-street parking lane.
4. Building frontage.
5. Sidewalk.
6. Bike lane.
7. Accessible ADA ramps at street intersection.
8. Curb extensions narrow the pedestrian crossing distance, but allow two-way vehicular traffic

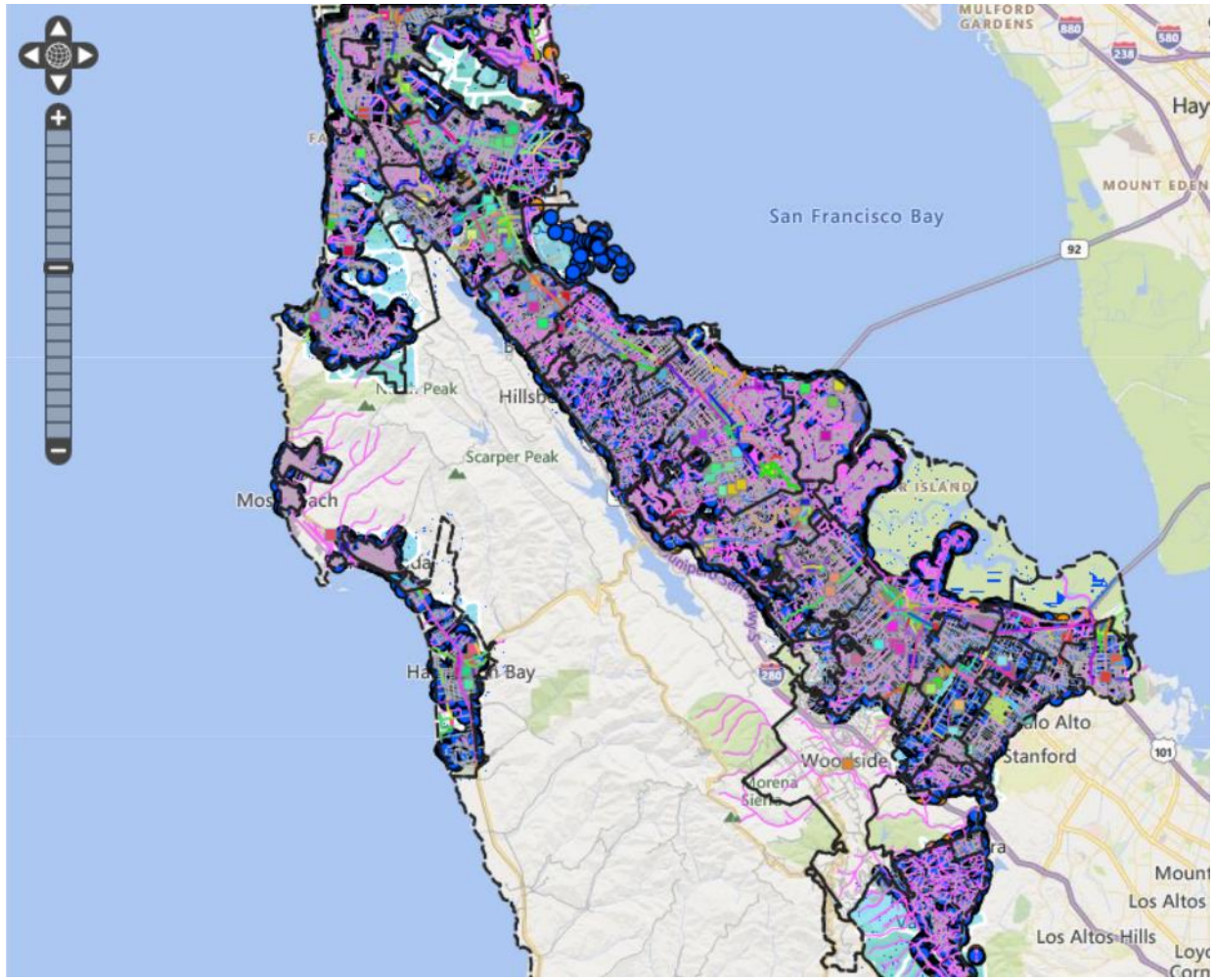
▲ *EXAMPLE: Stormwater planters used along a downtown street. Notice that there is adequate space allocated for people to get in and out of their vehicles and access the sidewalk and frontage uses.*

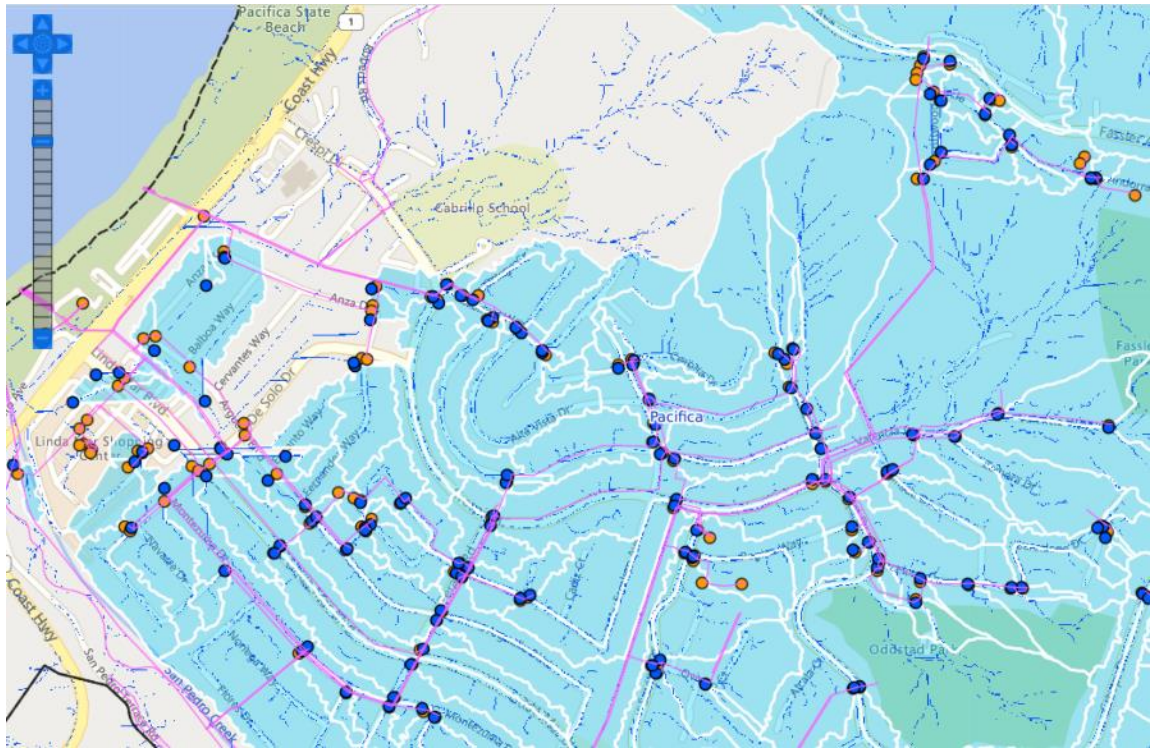
A.3 Appendix 3
Sustainable Streets Typical Design Details

	Sustainable Streets Typical Details	SMCWPPP Typical Details not in SFPUC Typical Details	SMCWPPP Typical Details Modified From SFPUC Typical Details	Jump to PDF	Jump to CAD
	Bioretention Components				
BC 1.1	Bc 1.1 Edge Treatments - Designer Notes			→	
BC 1.2	Edge Treatments - Vehicular Applications (1 of 2)			→	
BC 1.2.1	Edge Treatments - Vehicular Applications Modification (1B of 2)	X		→	
BC 1.3	Edge Treatments - Vehicular Applications (2 of 2)			→	
BC 1.4	Edge Treatments - Pedestrian Applications (1 of 2)			→	
BC 1.5	Edge Treatments - Pedestrian Applications (2 of 2)			→	
BC 1.6	Edge Treatments - Lateral Bracing (1 of 2)			→	
BC 1.7	Edge Treatments - Lateral Bracing (2 of 2)			→	
BC 2.1	Inlets - Designer Notes		X	→	
BC 2.2	Inlets - Curb Cut with Gutter Modification		X	→	
BC 2.2.1	Inlets - Curb Cut with Metal Plate Top Modification	X		→	
BC 2.3	Inlets - Curb Cut at Bulb Out			→	
BC 2.3.1	Inlets - Curb Cut at Bulb Out Modification	X		→	
BC 2.4	Inlets - Curb Cut with Trench Drain			→	
BC 2.4.1	Inlets - Curb Cut with Trench Drain with Metal Plate Top Modification	X		→	📎
BC 2.5	Embedded Rock Energy Dissipator	X		→	
BC 3.1	Outlets - Designer Notes		X	→	
BC 3.2	Outlets - Curb Cut			→	
BC 3.3	Outlets - Curb Cut with Trench Drain			→	
BC 3.3.1	Outlets - Curb Cut with Trench Drain w- Metal Plate Top Modification	X		→	
BC 3.4	Outlets - Overflow Structures			→	
BC 4.1	Aggregate Storage Layers			→	
BC 5.1	Underdrains - Designer Notes			→	
BC 5.2	Underdrains			→	
BC 6.1	Check Dams - Designer Notes			→	
BC 6.2	Check Dams			→	
BC 7.1	Outlet Monitoring - Designer Notes			→	
BC 7.2	Outlet Monitoring - External Access Structure			→	
BC 7.3	Outlet Monitoring - Internal Catch Basin Monitoring			→	

	Sustainable Streets Typical Details	SMCWPPP Typical Details not in SFPUC Typical Details	SMCWPPP Typical Details Modified From SFPUC Typical Details	Jump to PDF	Jump to CAD
	Subsurface Infiltration				
SI 1.1	Designer Notes (1 of 2)			→	
SI 1.2	Designer Notes (2 of 2)		X	→	
SI 2.1	Infiltration Gallery - Large System - Plan			→	
SI 2.2	Infiltration Gallery - Large System - Section		X	→	📎
SI 3.1	Dry Well - Small System - Plan			→	
SI 3.2	Dry Well - Small System - Section		X	→	
SI 4.1	Dry Well - Deep – Plan and Section	X		→	
	General Components				
GC 1.1	Liners - Designer Notes			→	
GC 1.2	Liners - Liners and Attachments			→	
GC 2.1	Utility Crossings - Designer Notes (1 of 2)			→	
GC 2.2	Utility Crossings - Designer Notes (2 of 2)			→	
GC 2.3	Utility Crossings - Bioretention			→	
GC 2.4	Utility Crossings - Bioretention Sections (1 of 2)			→	
GC 2.5	Utility Crossings - Bioretention Sections (2 of 2)			→	
GC 2.6	Utility Crossings - Permeable Pavement			→	
GC 2.7	Utility Crossings - Pavement Sections (1 of 2)			→	
GC 2.8	Utility Crossings - Pavement Sections (2 of 2)			→	
GC 2.9	Utility Crossings - Liner Penetrations			→	
GC 2.10	Utility Crossings - Wall Penetrations (1 of 2)			→	
GC 2.11	Utility Crossings - Wall Penetrations (2 of 2)			→	📎
GC 2.12	Utility Crossings - Utility Trench Dam			→	
GC 3.1	Utility Conflicts - Designer Notes			→	
GC 3.2	Utility Conflicts - Street/Traffic Light Poles (1 of 2)			→	
GC 3.3	Utility Conflicts - Street/Traffic Light Poles (2 of 2)			→	
GC 3.4	Utility Conflicts - Parking Meters			→	
GC 4.1	Observation Ports - Designer Notes			→	
GC 4.2	Observation Ports - Bioretention			→	
GC 4.3	Observation Ports - Permeable Pavement			→	
G C5.1	Cleanouts			→	
GC 6.1	End-of-Block Monitoring - Designer Notes			→	
GC 6.2	End-of-Block Monitoring			→	

Drainage Area Assessment Tool





- Hi-resolution drainage areas for the whole county
- Web-based map viewer and tool for evaluating project opportunities

Stormwater Curb Extension Tool

STORMWATER CURB EXTENSION - INTERSECTION OPPORTUNITY ASSESSMENT

CCAG Map Photo Insert Here

Google Maps Street View #1 Insert Here

Google Maps Street View #2 Insert Here

STREET DETAILS		ADDITIONAL NOTES
Primary Street Being Assessed	Oriente St & Partridge St	Oriente and Partridge are 35' wide, thus providing up to 6.5' of width for curb extensions
Street Type [a]	Residential	C1, C2, D1, D2 are all high points. However, curb extension may be feasible for C2 if catch basin were moved, to allow flows to drain without driveway limitations on C1.
Available Width (ft) [b]	6.5'	Due to driveway limitations, curb extensions may not be feasible for GI treatment for flows on western portion of Oriente.

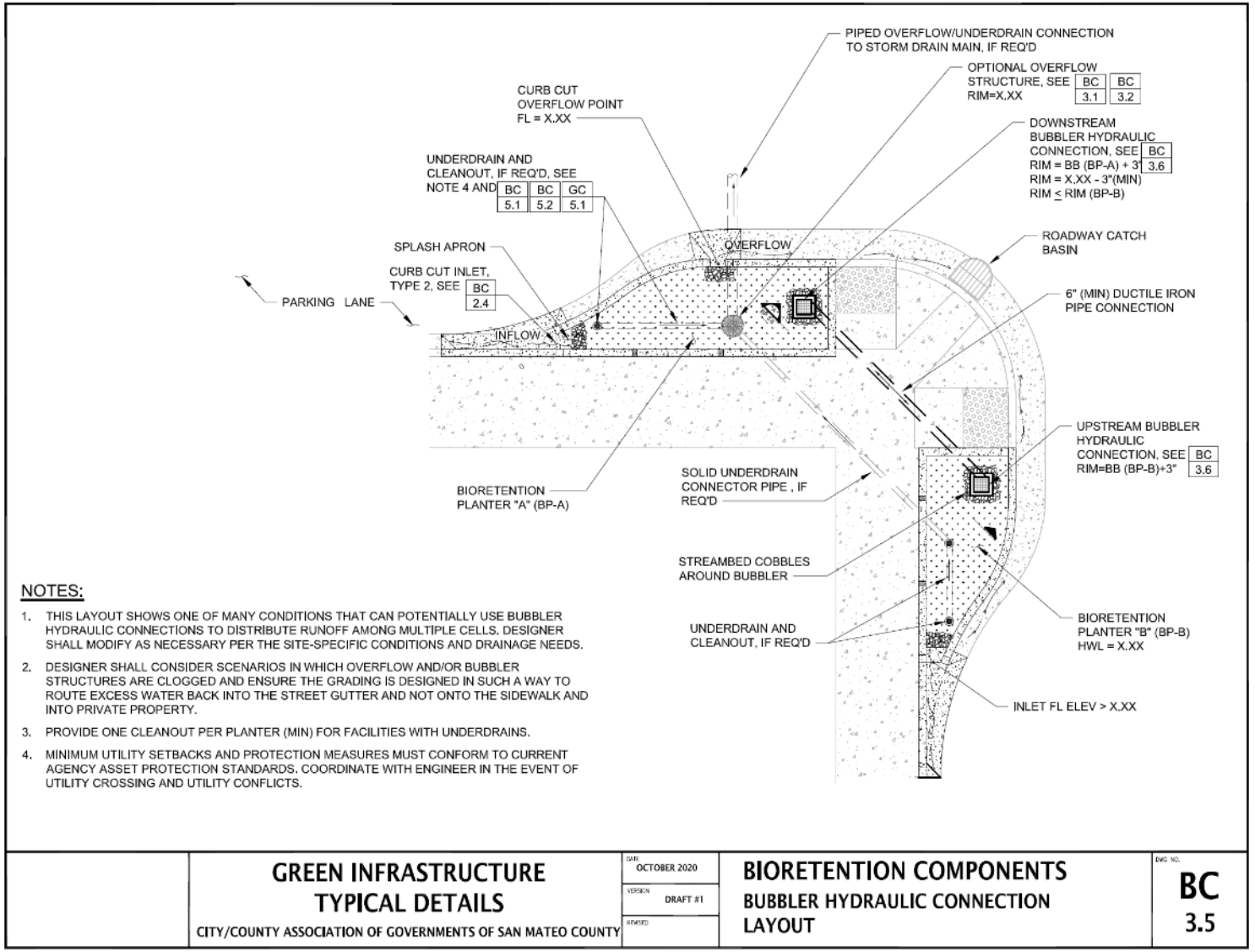
4-CORNER ASSESSMENT	A1	A2	B1	B2	C1	C2	D1	D2
Section 1 - Feasibility	Curb extension not recommended at corner if any of the boxes below are checked							
Does not receive any stormwater runoff	☐	☐	☐	☐	☐	☐	X	✓
Underdrain needed and no storm drain at intersection	☐	☐	☐	☐	☐	☐	☐	☐
Water main on same side of street with dia ≥ 12 inch	☐	☐	☐	☐	☐	☐	☐	☐
Less than 20 ft from start of corner to first driveway [c]	✓	☐	☐	✓	✓	☐	☐	✓
Roadway width is less than minimum required	☐	☐	☐	☐	☐	☐	☐	☐
Major gas transmission pipeline on same side of street [d]	☐	☐	☐	☐	☐	☐	☐	☐
Bus stop with concrete pad within footprint	☐	☐	☐	☐	☐	☐	☐	☐
Longitudinal street slope > 5%	☐	☐	☐	☐	☐	☐	☐	☐
Large duct bank (≥ 3 ft) within proposed footprint	☐	☐	☐	☐	☐	☐	☐	☐
Electrical/telecom vault within proposed footprint	☐	☐	☐	☐	☐	☐	☐	☐
Section 2 - Constraints	Curb extension not recommended at corner if 3 or more of the boxes below are checked							
Duct bank within proposed footprint	☐	☐	☐	☐	☐	☐	☐	☐
Electrical/telecom vault on sidewalk adjacent to proposed footprint	☐	☐	☐	☐	☐	☐	☐	☐
Sewer main below proposed footprint	☐	☐	☐	☐	✓	☐	☐	✓
Water main < 12 inch dia within proposed footprint	✓	☐	☐	✓	☐	☐	☐	☐
Fire hydrant at corner	☐	☐	✓	☐	☐	☐	☐	☐
Depth to groundwater or bedrock < 10 ft	☐	☐	☐	☐	☐	☐	☐	☐
Open Geotracker cleanup site within 200 ft [e]	☐	☐	☐	☐	☐	☐	☐	☐
Drainage area to curb extension < 1000 sqft	☐	☐	☐	☐	☐	☐	☐	☐
Mature tree ≥ 6 inch dia within 20 ft of corner	☐	☐	☐	☐	☐	☐	☐	☐
Recommended for Curb Extension	**no**	**yes**	**yes**	**no**	**no**	**yes**	**no**	**no**

- Supports future rapid assessments for opportunities to integrate green infrastructure at intersections
- Excel format
- Check-box results for feasibility at each corner

Sustainable Streets Typical Details

- Building a comprehensive Sustainable Streets Typical Details library to support GI design and implementation

- Integrated with GI Design Guide resources via www.flowstobay.org

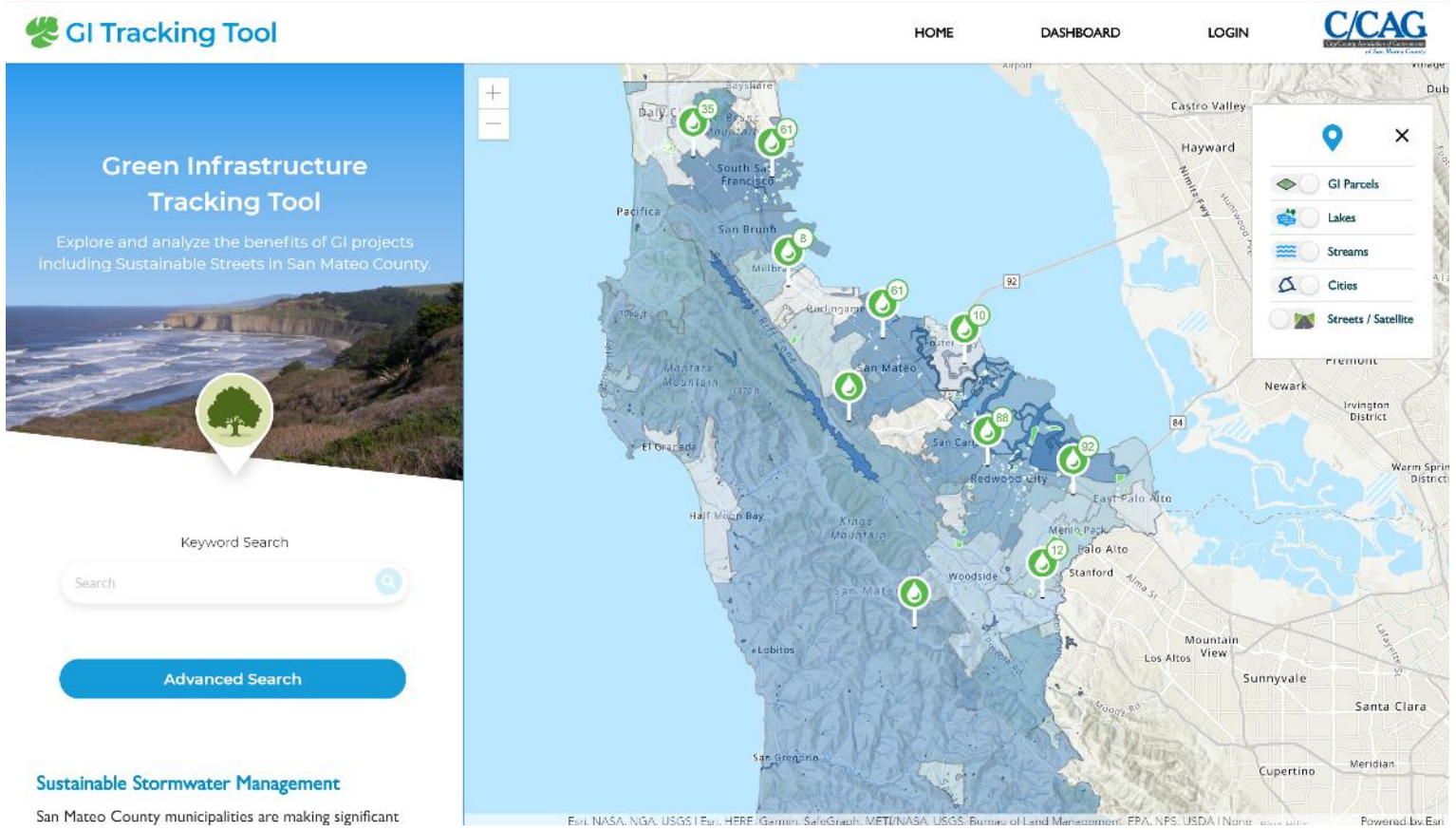


Sustainable Streets Policies

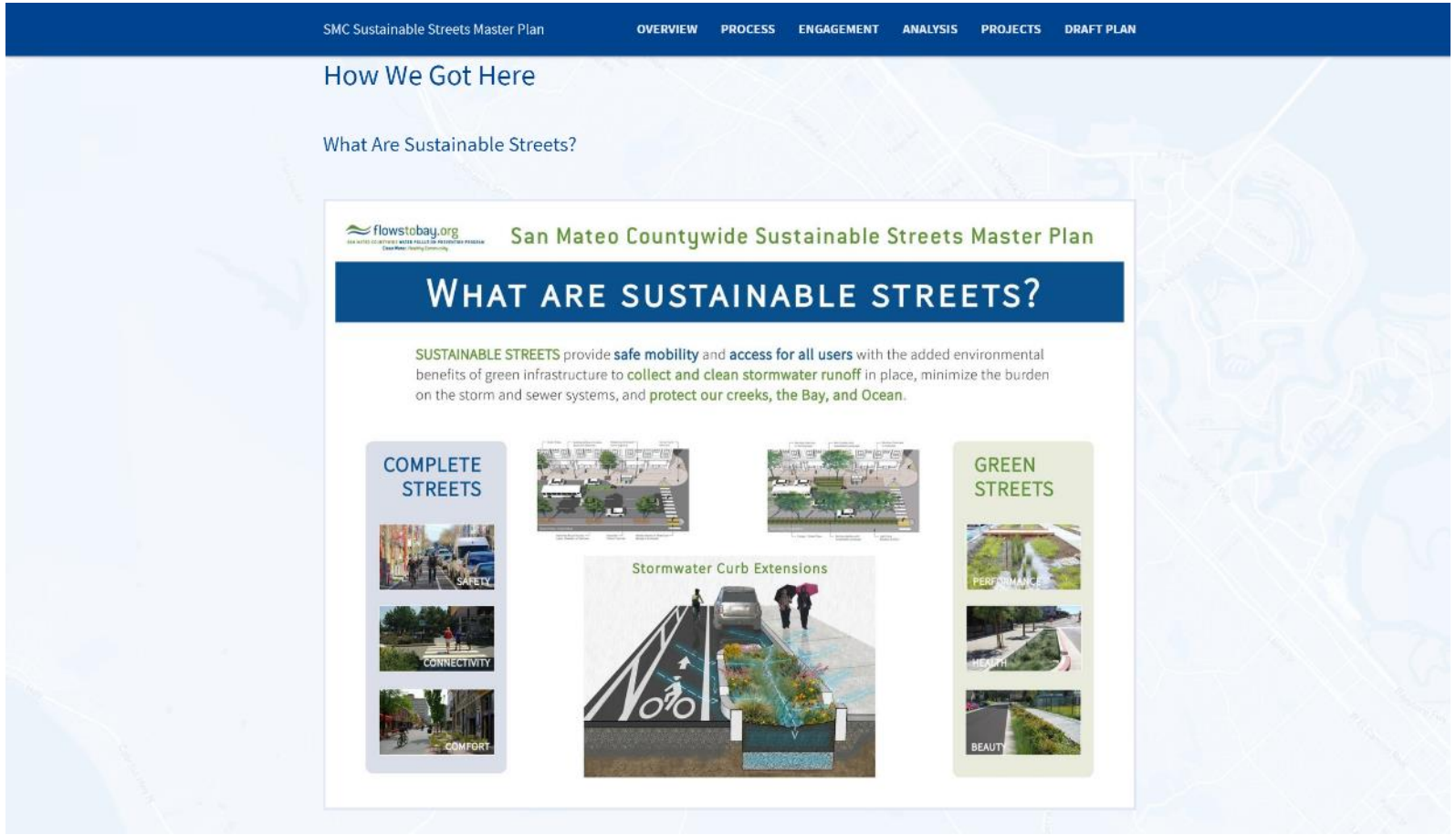
- Model Sustainable Streets Resolution and Policy
- Model Sustainable Streets language for municipal plans
- Examples of General and Municipal Plan language
  - Redwood City, Menlo Park, San Mateo, Emeryville
- Model Standard CoAs for Development Projects
- Example Standard CoAs for GI in Development Frontage
  - Menlo Park, Emeryville, South San Francisco, San Mateo, Redwood City
- Example Green Infrastructure Development Standards
  - Redwood City

GI Mapping and Tracking Tool

- Mapping and tracking **ALL** green infrastructure project types
- Supports GI Plan implementation
- Includes water quality and climate change metrics
- Supports public education



Master Plan “Virtual Open House”



Virtual Community Engagement Hub and Open House
December 8, 6-7 PM

Master Plan Schedule

Sustainable Streets Master Plan Schedule

- Master Plan Virtual Open House – December 8, 2020
- Public/Stakeholder Comments on Plan – Mid-December
- CCAG Board Introduction Presentation – December 10, 2020
- Final Draft Master Plan – Mid-January 2021
- Proposed CCAG Board Adoption – February 11, 2021

Caltrans

flowstobay.org
SAN MATEO COUNTYWIDE
WATER POLLUTION PREVENTION PROGRAM
Clean Water. Healthy Community.

C/CAG
City/County Association of Governments
of San Mateo County

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